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ESTUDIO DE LA RENTABILIDAD-RIESGO HEDGE FUNDS vs NEWCITS

RISK-RETURN RESEARCH OF HEDGE FUNDS vs NEWCITS

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I. ABSTRACT

This study explores the main aspects of hedge funds and of UCITS funds in a detailed, thorough and precise way. In the first place, the main characteristics of hedge funds will be defined, to then carry out a deep analysis of the historical evolution of the hedge fund industry. In addition, some other important aspects of hedge funds, such as the applicable regulation, operating structure, different strategies implemented, as well as the main risks of this type of investment vehicles, will be analyzed in detail. Subsequently, a thorough analysis of the main aspects of UCITS funds will be conducted. In this case, the main characteristics of this type of investment vehicles will be defined, to then conduct a deep analysis of the evolution that has taken the UCITS fund industry in the last decades. Afterwards, some other aspects of UCITS funds, such as the advantages and disadvantages over other investment vehicles, as well as the different strategies implemented, will be analyzed to, finally, present an example of a real UCITS fund. After having analyzed the main aspects of hedge funds and of UCITS funds, a quantitative analysis will be carried out. In this analysis, the performance of the different strategies implemented by hedge funds and by UCITS funds will be analyzed on an individual basis, to then carry out a comparative analysis of the individual results. In this comparative analysis of the individual results, the equivalent strategies implemented by hedge funds and by UCITS will be compared. Then, the different strategies will be ranked according to the efficiency achieved during the period. Afterwards, an analysis of 3 model portfolios composed of different assets will be carried out, in order to see the impact of hedge funds and of alternative UCITS in the performance of the portfolios. Finally, the main conclusions of the study will be presented.

**Keywords:** Hedge Funds, UCITS Funds, Characteristics, Historical Evolution, Strategies, Performance, Comparative Analysis.
1. INTRODUCTION

In recent years, hedge funds have become, without any doubt, the most attractive and successful firms in the financial world, thanks in part to the impressive results that have achieved in a diverse number of market situations. In this regard, hedge funds have been able to reach the top of the pyramid of the financial world, after having surpassed large investment banks.

However, not all hedge funds have been able to achieve great results over the last decades, as there have been a high number of funds that have ended up disappearing shortly after starting their operations as a result of their poor performance. In addition, and along with the above mentioned aspect, in recent years also has been developed a negative opinion about the behavior of this type of investment vehicles, particularly because, from different parts of the world, many people have blamed hedge funds of causing the international financial crisis that began in late 2007, and that caused the loss of millions of jobs, as well as deep recessions in many economies worldwide. Nevertheless, some studies concluded that “hedge funds cannot be considered as a cause of financial crises (Hurtado, 2004)”. 

However, it must be said that hedge funds are sophisticated investment vehicles that are exclusively intended for high net worth investors and with a great financial knowledge. For this reason, there is a large number of investors from around the world that do not have access to the benefits of hedge funds, regardless if they understand the different strategies implemented, as well as the various risks of these investment vehicles, or not.

On the other hand, in recent years have grown largely the UCITS funds, a new type of investment vehicle developed in the European Union that has become a really attractive investment for many investors from around the world. In this regard, in some countries, UCITS funds have been able to outperform hedge funds in terms of assets under management, as well as in terms of performance, due to their several advantages, as well as due to the strong protection of the interests of their investors as a result of the strict legislation applicable to the UCITS fund industry.

All the above mentioned aspects, have led to a situation in which an investor may wonder if the behavior that hedge funds have had over the last years really justifies their higher costs compared to other investment vehicles or not. Therefore, it is interesting, as well as important from a practical and theoretical point of view, to compare the performance of hedge funds with that of UCITS funds, in order to determine which one of the two investment vehicles may be considered as the true leader of the asset management industry globally.
In this regard, this study tries to dispel any doubts that an investor may have about both investment vehicles and to determine, in a clear and precise way, if the fame that hedge funds have achieved over the last decades is well deserved or, conversely, if UCITS funds have been able to achieve a better or similar performance, but with a greater protection of the interests of their investors. For this purpose, the study is structured as follows:

In the first chapter, a brief introduction of hedge funds and of UCITS will be given.

Then, in the second chapter, the main aspects of hedge funds will be analyzed in depth.

The chapter starts by defining this type of investment vehicles, as well as their main characteristics, in order to help investors to know in detail the main aspects that distinguish hedge funds from other investment vehicles that exist within the asset management industry.

After having analyzed the main characteristics of hedge funds, a detailed analysis of their historical evolution will be conducted, starting from the creation of the first hedge fund in 1949. In this regard, an historical approximation of the evolution that has been experiencing the hedge fund industry over the past six decades will be carried out, paying special attention to the different investment vehicles established by the most prominent figures of the industry, as well as to the various crises and stages through which the industry has passed.

In the third place, the operational structure of hedge funds will be analyzed in detail. On the one hand, the main legal structures used by this type of investment vehicles will be studied to, then, conduct an analysis of their organizational structure. In this regard, the several service providers used by hedge funds to carry out the activities needed for the proper functioning and development of the business in a more efficient way will be defined. Finally, the main alternative structures that hedge funds often choose in order to satisfy the desires of certain investors will be analyzed.

Subsequently, the legislation and regulations applicable to hedge funds in the US, UK and Asia will be analyzed, in order to understand in a simple and precise way the different laws that affect this type of investment vehicles. In addition, special attention will be paid to the several exemptions included in certain laws used by hedge funds to increase their efficiency, as well as to achieve competitive advantages over other traditional investment vehicles.
After having analyzed the applicable regulation of the hedge fund industry, a deep analysis of the main strategies implemented by this type of investment vehicles will be carried out. In this regard, each strategy will be analyzed on an individual basis, paying special attention to the advantages and disadvantages of the strategy compared to other strategies, as well as to the different techniques used by hedge funds to achieve higher and sustainable returns. In addition, and given the high level of complexity of some strategies, as well as due to the different possibilities that portfolio managers have, in certain cases, the several sub-strategies that exist within a main strategy will be analyzed.

The chapter concludes with the definition, and subsequent development, of the major risks posed by hedge funds, in order to help all those investors who are planning to carry out an investment in these investment vehicles to know in detail the different risks faced.

In the third chapter, a deep, clear and accurate analysis of the main aspects of UCITS funds will be carried out.

In the first place, UCITS funds will be defined to, then, conduct an analysis of the main characteristics of this type of investment vehicles. In addition, an analysis of the major differences between UCITS funds and hedge funds will be carried out.

After having defined the main characteristics of UCITS funds, a thorough analysis of the historical evolution that has taken the UCITS fund industry in the last decades will be conducted. In this regard, the several directives introduced by the member countries of the European Union aimed to regulate the activities of this type of investment vehicles will be analyzed in detail, paying special attention to the different restrictions, eligible assets, as well as to the several limits, applicable to UCITS funds when making investments. Along with this, the main differences between unsophisticated and sophisticated or alternative UCITS funds will be analyzed in detail.

Furthermore, a deep analysis of the main advantages and disadvantages of UCITS funds compared to other investment vehicles will be carried out, in order to help all those investors who are considering an investment in these funds to know in advance their strengths and weaknesses.

Then, the different strategies implemented by UCITS funds will be analyzed, distinguishing between those that may be implemented only by sophisticated funds, and those that may be implemented by sophisticated and by unsophisticated funds. In
addition, the main financial instruments used by sophisticated UCITS funds to implement complex strategies will be defined.

The chapter concludes with a real example of a UCITS fund that will be analyzed in detail. For this purpose, the several documents of the fund, in which the main aspects of the investment vehicle are included and defined, will be analyzed, in order to help all those investors who are considering an investment in this type of investment vehicle to know in detail all the main characteristics of a real UCITS fund.

In the fourth chapter, a thorough, detailed and accurate quantitative analysis of each of the strategies implemented by UCITS and by hedge funds included in two of the most important databases, which are the Credit Suisse Hedge Fund Database and the Alix Capital UCITS Alternative Database, will be conducted. In addition, the chapter includes an analysis of the impact of hedge funds and alternative UCITS in 3 model portfolios.

In the first place, and before conducting the quantitative analysis, the key metrics that will be used to assess aspects such as returns, risks or risk-adjusted returns, of each of the strategies analyzed will be defined in detail. In addition, an analysis of all the potential biases of the databases used, as well as of the advantages and disadvantages of using indexes of hedge funds and of UCITS, will be carried out.

Subsequently, the performance over the last 1, 3 and 7 years, of the different hedge fund indexes included in the hedge fund database will be analyzed in depth. In this regard, several statistics will be calculated and analyzed, such as the returns achieved by the index; its volatility; its Sharpe ratio, as the primary measure of risk-adjusted return; its Treynor ratio; its beta; its best and worst month; its maximum drawdown, along with its recovery time; as well as the correlation of the strategy with the other strategies analyzed. On the one hand, the performance of each of the strategies will be analyzed on an individual basis, to then conduct a comparative analysis of the individual results.

Then, a deep analysis of the performance over the last 1, 3 and 7 years of the alternative UCITS indexes included in the UCITS funds database will be carried out. For this purpose, the same metrics used in the analysis of the performance of hedge funds will be calculated and analyzed. In addition, and as in the case of hedge funds, the different indexes will be analyzed on an individual basis, to then conduct a comparative analysis of the individual results achieved by the several strategies implemented by UCITS funds.
After having analyzed the performance of hedge funds and of UCITS funds over the last 1, 3 and 7 years, a comparative analysis of the equivalent or comparable strategies implemented by both investment vehicles will be conducted. In addition, the results achieved by the aggregate indexes of hedge funds and of UCITS funds will also be compared.

Afterwards, the several indexes will be classified according to the efficiency achieved during the period, in order to determine which strategies have been the top-performing strategies in the last 7 years. For this purpose, the Sharpe and Treynor ratios of the different indexes analyzed will be used.

Finally, an analysis of the impact of hedge funds and of alternative UCITS in the performance of three model portfolios composed of different assets will be conducted. To do that, the multi-strategy indexes of hedge funds and of alternative UCITS will be used.

In the fifth and final chapter, the main conclusions of the study will be presented in a clear and precise way.

In order to achieve the objectives of the study, the existing literature, both theoretical and empirical, as well as many other resources such as articles, documents, legislation, databases and reports, will be analyzed and reviewed in a detailed, methodical and thorough way, paying special attention to the most relevant aspects, either qualitative or quantitative.
2. HEDGE FUNDS

2.1 DEFINITION

2.1.1 Definition

Because of the fascination that hedge funds\(^1\) have caused over the past years due to the impressive returns provided to investors, in many cases much higher than those obtained by the market or the traditional asset management industry, a great number of agencies have been created, mostly of them nonprofit, in order to be responsible for representing the industry; promoting transparency and good practices; as well as for educating investors to help them understand this type of investment vehicles, including their benefits and possible risks. In addition, over recent years, plenty of authors from around the world, many of whom remain or have been asset managers in the past, have chosen to write their own books to try to deepen, in the best possible way, into this exciting industry.

Although it may seem surprising given the existing literature, research, presentations of funds and information of all types of strategies on the hedge fund industry, there is still no definition that can be considered as universal when comes to classify this type of investment vehicles\(^2\). In fact, the closest to that definition have been different approaches in which authors have tried to define hedge funds through an enumeration of the most important features found in the industry and subsequent further assessment of each of them.

However, it must be said that the main reason that make us understand why there is no universal definition of hedge fund lies in the diversity of strategies implemented at present, which in some cases have very noticeable differences when compared with others, as well as the different legal structures adopted by each of the funds, which can lead many people to think that they are different investment vehicles.

Even though the difficulty of defining hedge funds on a universal way due to the heterogeneity of the industry, there are certain common characteristics shared by the vast majority of funds that allow us to make an approximation of what, in general terms, is meant by a hedge fund.

Lhabitant, F.: Hedge Funds: Myths and Limits, Wiley, 2002

\(^2\) Even sometimes the definitions of different experts pose contradictory aspects.
We can define a hedge fund as any flexible investment vehicle, loosely regulated\(^3\) and intended for sophisticated investors\(^4\), that seeks absolute returns by using for this purpose unconventional strategies and methodologies compared to those implemented in the traditional asset management industry.

2.1.2 Key characteristics

Once defined, in general terms, what is meant by a hedge fund, it's time to move on to discuss in detail the key characteristics\(^5\) that tend to have this type of investment vehicles.

- **Diversity**: The first important aspect to keep in mind when analyzing the hedge fund industry is its heterogeneity when looking at the strategies, including sub-strategies within each of them, implemented by these funds to generate absolute returns. The different strategies implemented by hedge funds are shown in the following figure.

![Figure 1: Main Hedge Fund Strategies](image)

Source: Compiled by author based on Lhabitant, F.: Handbook of Hedge Funds, Wiley, 2006

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\(^3\) Hedge funds are not subject to a significant portion of the existing regulation aimed to protect investors in charge of regulating the traditional asset management industry. In addition, there is no public institution overseeing the hedge fund industry.

\(^4\) Usually, hedge funds have very high minimum investment requirements for the general public (in many cases there’s $1 million of USD of minimum investment required). Also, in certain countries such as the United States, only accredited investors are entitled to invest, understanding by accredited investor by someone with a minimum net worth of $1 million or an annual income of more than $200,000 without including the income of other family members.


Among the most common, which will be analyzed individually and in greater detail later, there are relative value strategies, which seek to exploit inefficiencies between prices of financial assets that may appear temporarily in the market; event driven, whose main objective is to seize opportunities that arise before, during or even after different corporate events such as mergers, restructurings, acquisitions, equity issues or bankruptcies, among others; directional strategies, which seek to exploit market trends rather than focusing on single values; long/short equity, seeking overvalued and undervalued stocks relative to comparable companies; and a final group where all the new developed strategies not belonging to any of the above categories fall. Furthermore, and along with the above strategies, hedge funds often employ investment methods that are rarely applied by traditional asset managers such taking short positions or using leverage to maximize returns of the strategies implemented.

- **Special fee structure**: Hedge funds have a fee structure that, usually, tends to be kept in a similar way within the industry⁶. On the one hand, hedge funds typically charge a management fee, usually 2%, which applies to assets under management (AUM). These revenues are used by the fund to address operating expenses such wages, selling, general and administration costs, among others. On the other hand, hedge funds charge a performance fee, usually 20%, which applies to positive returns generated by the fund. This fee is charged to reward those managers who have been able to achieve positive returns during the period. Ultimately, it serves to reward a well done work. In this regard, it must be said that certain studies concluded that “management fees as a percentage of AUM are an increasing function of AUM whereas performance fees are a decreasing function of AUM (Joenväärä, Juha & Kosowski, 2013)”.

However, the payment of the performance fee is usually conditional on the fulfillment of certain clauses such as the existence of hurdle rates, which define a minimum return to be achieved by the manager before collecting performance fee; and even high water marks that prevent funds to charge the performance fee if the net asset value of the fund is below its peak, in order not to reward managers who have obtained a positive return after a mediocre period, among others. With the above, it must be known that the existence of such clauses may allow, in certain cases where there is only one type of shares, that certain investors that decide to invest just after a drop in the value of the fund may not be paying performance fees, regardless of whether they have received a positive return, if the fund continues to report assets under management below its peak. Regarding to high water mark clauses, it must be noted that some studies concluded that “hedge fund performance fees are valuable to money managers, and conversely represent a claim on a significant proportion of investor wealth,.

⁶ In fact, some authors even refer, sometimes in a humorous way, that a hedge fund is “anything that charges a 2% management fee and a 20% performance fee”.
so the high water mark provisions in these contracts limit the value of the performance fees (Goetzmann, Ingersoll & Ross, 2001).

The following figure shows the mean management and performance fees charged by hedge funds.

<table>
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<tr>
<th>Table 1: Mean Management and Performance Fees charged by Hedge Funds</th>
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<tr>
<td><strong>Mean Management Fee (%)</strong></td>
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<td>Single-Manager Funds</td>
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<td>Funds of Hedge Funds</td>
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<td>UCITS Funds</td>
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<td>Event Driven Strategies</td>
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<td>Long/Short</td>
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<td>Multi-Strategy</td>
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<td>Relative Value</td>
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<td>Other Strategies</td>
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Source: Hedge Fund Spotlight, Prequin, 2013

- **Search for absolute returns**: Unlike the vast majority of traditional mutual funds, hedge funds are actively managed with the aim of outperforming the returns achieved by the market\(^7\). This way of managing the funds of investors differ greatly when compared to traditional managers, who only intend to replicate the performance obtained by the market or by a given benchmark. However, hedge funds employ a large number of new tools, mechanisms and procedures, to achieve higher returns than those achieved by the market. In addition, those hedge funds that have sufficient assets under management pose a large number of competitive advantages over smaller funds that allow them or, at least, facilitate them to achieve very attractive returns for investors due to the extensive resources, both human and technological, they possess.

The return of a hedge fund comes primarily from two sources, which are beta and alpha, as can be seen in the following figure.

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The first one, beta, refers to non-diversifiable risk that a particular fund takes for the simple reason of being invested in the market. That is, for the simple reason of being exposed to a risk that cannot be mitigated through diversification, the market rewards with a certain risk premium. Beta can also be divided into structural beta, which refers to the risks taken when investing in any of the various asset classes, either market risk, interest rate, exchange rates, credit spreads or duration, among others; and alternative beta, which refers to aspects such as liquidity, volatility, correlation with other assets or idiosyncratic risks, among others.

The second source of return, alpha, is the excess return of the hedge fund over the return obtained by the market, a particular benchmark or the risk-free return. In other words, alpha is the additional return that an actively managed fund achieves compared to the return obtained by a traditional or passively managed fund.

Furthermore, this constant search for alpha explains the low correlation of hedge funds with traditional investments, something that has been very beneficial for the industry growth in recent years, given that a large number of institutional investors has decided to include hedge funds in their portfolios in order to improve diversification. Alpha can be divided in structural alpha, which refers to the competitive advantages of a hedge fund over other traditional funds, such as its smaller size or capacity, greater flexibility when implementing strategies and even less regulation applicable; and skill alpha, which refers to the additional return obtained by a hedge fund compared to traditional funds, and even to other hedge funds, due to the specific set of skills of its manager or managers, such as talent, investment procedures and assumptions when making investment decisions; the ability to generate new ideas; mastery or expertise on certain securities, sectors or countries; and even to their available skills when managing the various risks of the portfolio. In addition, it must be said that there are other sources of alpha, since recent studies concluded that “the impact of flows on returns has clear implications for performance evaluation, as one-third of estimated hedge fund alphas are due to flows (Ahoniemi & Jylhä, 2014)”.

- **Less capacity**: Seeking absolute returns is not a simple task that involves, to some extent, the use of comparative advantages that hedge funds have over traditional funds. If the assets under management of a hedge fund increase rapidly to high levels, the fund will become something similar to a traditional fund (in terms of AUM) and the correlation with the market will tend to increase, thereby obtaining lower returns. That’s why, once the fund has reached a certain volume of assets under management, it is closed to new investors in order to maintain its competitive advantage. In this regard, it must be noted that some studies concluded that “there is strong evidence that fund size erodes performance, and that the effect of fund size on fund returns is most pronounced for funds that play small cap stocks (Chen, Hong, Huang & Kubik, 2004)”.


In addition, another important issue is the fact that, if the hedge fund remains with a reasonable volume of AUM, the manager will be able to obtain better returns and thus will charge a performance fee which will be, in the majority of the cases, much higher than the additional management fee that it would receive in the case of having a greater volume of assets under management.

- **Alignment of interests**: An important feature within the hedge fund industry is the fact that managers often invest a high percentage of their personal wealth in the fund, thus aligning their interests with those of investors. In other words, a manager will have an additional motivation for obtaining positive returns because, otherwise, he will see his personal wealth reduced. Also, being invested in the fund is consistent with thinking that the manager will tend to implement reasonable risk management policies.

- **Targeted only to professional investors**: Hedge funds are investment vehicles intended only to those professional investors who are able to understand not only the benefits, but the risks involved in investing in these products. In addition, hedge funds often require an investment of at least $1 million, making very difficult to many investors, although they are able to understand the strategies implemented and the risks associated, to carry on an investment. Also, it is usually required that anyone wishing to invest in hedge funds must be an accredited investor.

Therefore, the main investors of hedge funds are institutional investors and even ultra-high net worth individuals with enough capacity to undertake such investments. The breakdown of hedge fund investors is shown in the following figure.

![Chart 1: Breakdown of Hedge Fund Investors](image)

Source: Alternative Investment Outlook, Deloitte, 2014
• **Less transparent**: Clearly one of the reasons that explain the fascination that hedge funds cause to a large number of investors around the world is the secrecy that surrounds them. In fact, the information about the positions taken by the most famous hedge fund managers in the world is extensive, and sometimes contradictory, with the aim of knowing their preferred strategies or assets.

Although there is some secrecy in the industry, partly because of the lower regulation affecting it, as well as due to the implications of revealing the different positions taken that may lead to front running and lower returns, it must be clear that hedge funds make available to their investors many information, sometimes very similar to that distributed by traditional asset managers. Anyway, hedge funds are less transparent than traditional mutual funds, as they rarely publish public information about the strategies implemented.

Furthermore, in recent years, transparency in the industry has grown largely due to the obligation of all those hedge funds managing more than $100 million to report their positions, which can be consulted publicly but with some delay.

• **Lower liquidity**: Another aspect that differentiates hedge funds from traditional asset managers is the fact that they have lower liquidity due to the different clauses they have. These clauses often determine aspects such as the terms of subscription, lock up periods during which investors may not recover their investment (sometimes a year or more), and the terms of redemption. In the latter case, there’s rarely daily liquidity, being the most common quarterly publication of NAV and, in some cases, annual, thus forcing investors to keep their funds invested a specified minimum period of time before having the ability to undo their positions. However and, in this regard, it must be said that recent studies concluded that “hedge funds often take on greater liquidity risk exposure than they should, as the rewards to bearing liquidity risks are substantial, so within the group of funds that offer favorable redemption terms to their investors, those that embrace liquidity risk harvest substantially higher returns than those that shun liquidity risk (Teo, 2011)”.

Furthermore, it is common that investors also need to notice in advance if they wish to recover their funds. In addition, it is also common the existence of different provisions indicating, among other things, the maximum number of shares that can be amortized in a particular redemption period, as well as certain penalties.

• **Unusual legal structures**: Another of the key characteristics of the hedge fund industry lies in the fact that, in contrast to the vast majority of traditional mutual funds distributed to retail public, hedge funds, in order to gain a comparative advantage over the latter, tend to have different legal structures than those commonly known.
Usually, US hedge funds often take the form of limited partnerships (LP) or limited liability companies (LLC), the latter being the most common in recent years. Moreover, it is quite common to find hedge funds based in tax havens in order to increase their efficiency. However, it must be noted that recent studies concluded that “after having analyzed the risk-adjusted performance of hedge funds, after controlling all three types of liquidity risk (market liquidity, share liquidity, and asset liquidity), there is some evidence that onshore funds outperform offshore funds (Aragon, Liang & Park, 2011)”.

In the case of a LP, there is usually one (but may be more) general partner running the business that is liable with both his contributions and personal wealth for the losses and debts that may arise. That’s why the general partner tends to be a LLC to reduce risk. Along with these partners, investors are defined as limited partners and, as its name suggests, they have limited liability if losses arise.

On the other hand, a LLC is usually the most common legal structure taken by hedge funds. In this type of structure, there are simple members, which are equivalent to shareholders of a traditional company or limited partners of an LP; and managers, who are responsible for managing the business, although in neither case members are personally liable for the company's debts or liabilities. This is the main reason that explains the boom of this type of legal structure in the hedge fund industry in recent years.

Examples of a typical LLC and of a LP are shown in the following figure.

![Figure 3: Examples of a typical LLC & LP](source: Liabrant, F.: Handbook of Hedge Funds, Wiley, 2005)

- **Flexibility**: The last one of the key characteristics of hedge funds compared to traditional funds is their huge flexibility when implementing investment strategies aimed to generate superior returns than those obtained by the market. In this regard, it must be said that recent studies concluded that “the hedge fund industry may have played more of a role in creating liquidity and making markets efficient than the mutual fund industry, and that it could do so because it
was generally not regulated, so that funds were free to take whatever positions they wanted and to make full use of financial innovations (Stulz, 2007)

In the case of traditional mutual funds, it is very common to see in the Investment Policy Statement or IPS, which defines several rules that the manager has to follow when managing the funds; restrictions affecting the assets in which to invest; maximum or minimum percentages of the portfolio that must be invested in each asset, sectors or regions; as well as aspects concerning the level of risk tolerance that the manager can assume. All these restrictions prevent or, at least make it harder, to achieve higher returns than those obtained by the market.

In contrast, hedge funds have total flexibility when carrying out the different strategies desired, to take risks, to allocate assets and even to use derivatives, among other things, in order to seek positive returns regardless of the market timing.
2.2 HISTORICAL EVOLUTION OF HEDGE FUNDS

There’s no doubt that, nowadays, hedge funds are considered by mostly of the investment community as the real rock stars within the financial industry, even though there’s lack of knowledge, as well as consensus, when it comes to define accurately what a hedge fund really is. Subsequently, we’ll delve into the main aspects of these appealing investment vehicles such as their operating structure, different strategies implemented, regulation or risks, among others, but first it is important, as well as interesting from a theoretical point of view, to analyze the historical evolution of hedge funds since its inception back in 1949, in order to understand all the shifts that transformed and shaped the industry and, in other words, know how it evolved into what it is today.

2.2.1 Alfred Winslow Jones: The pioneer of the hedge fund industry

Even though some studies may lead us to think that the methodology implemented by the vast majority of hedge funds that exist today has its origins back in 1930, as pointed out by certain publications that, at that time, were addressed to a purely scientific public, it is undeniable that the launch of the first for profit hedge fund has to be attributed to Alfred Winslow Jones in 1949.

Born in Melbourne, Australia, in 1902, Jones moved with his family to the United States at the age of four because his father was promoted to a senior executive role in the US multinational General Electric. In his youth, Jones showed no particular interest in finance and worked in various low-paying jobs before earning his Bachelor’s in Sociology from Harvard University. After graduation, he started a successful diplomatic career that allowed him to travel around the world and, in particular, around Europe. Years later, he became Vice Consul at the US Embassy in Berlin during the years when Hitler became a prominent figure within the German society. After that, he chose to shift his career into journalism and became a war correspondent in Spain during the bloody civil war that took place in the 30s in the Mediterranean country.

In the 40s and, back in America, Jones received his doctorate in sociology from Columbia University and started working on the prestigious business magazine Fortune. It was at this time when he became a passionate for the world of finance, due in part to his job as an analyst of the existing asset management industry and, in particular, of the

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9 To delve further in this issue, it is recommended the review of the publications “Scientific forecasting” and “Charts and graphs”, both of Karl Karsten.
strategies implemented by the leading investment vehicles at that time. This job gave him the opportunity to get closer to the investment practices implemented and, ultimately, he began to develop the skills needed to invest in the most appropriate and accurate way.

However, it was not until 1949 when Jones decided to launch his own investment vehicle. He was convinced that, with an innovative investment methodology and radically opposed to those implemented to date, he would be able to achieve better results than those obtained by the industry. With an initial capital of $100,000, of which $40,000 were Jones’ own capital, he launched "AW Jones & Co" which, even today in operation, is regarded as the first hedge fund in history.

The new investment vehicle developed by Jones had a structure in which the number of participants was limited to 99 in order to evade the requirements of the "Investment Company Act" of 1940, which was introduced to avoid a similar situation to the one that led to the Crash of 29, and that included responsibilities and limitations established for all those collective investment institutions that were selling their shares to the general public. In addition, Jones also took advantage of another piece of existing legislation at the time, the "Securities Act" of 1933, which exempted from registration with the SEC to all those investment companies that were selling their shares to accredited investors. All this gave him great flexibility to implement the methodology he wished to develop, which in turn led to a significant competitive advantage over other investment funds, and that enabled him to carry out strategies and actions rarely implemented in the asset management industry at that time, such as taking short positions, use of leverage, or concentrating investments in certain securities or specific sectors, as opposed to diversification.

The investment philosophy of Jones was relatively simple: he thought that, with a combination of long positions, which allowed him to make money with rises in the market; and short positions, very appropriate for situations of falling markets, he could have a portfolio able to weather market fluctuations and, thereby, to achieve stable and consistent returns over time. This way of managing positions gave birth to the denomination of hedge fund, given that the main objective of this operative was to hedge the possible risks that may emerge in the market by combining long and short positions. In addition, and as opposed to other asset managers that were operating at that time, Jones' methodology was intended to make money regardless of market timing, at least in theory.

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10 For those interested in learning more about the firm, you can visit its own website via the following link: [http://www.awjones.com/](http://www.awjones.com/)

11 The current version of the law, which includes several amendments, is included at the following link: [https://www.sec.gov/about/laws/ica40.pdf](https://www.sec.gov/about/laws/ica40.pdf)

12 The current version of the law, which includes several amendments, is included at the following link: [https://www.sec.gov/about/laws/sa33.pdf](https://www.sec.gov/about/laws/sa33.pdf)
Another characteristic that shows the similarity between the investment vehicle launched by Jones 60 years ago and the hedge funds that exist today is its fee structure, as it had a performance fee of 20% applied to profits generated by the fund. Also, the partners, Jones included, were asked to invest their own capital into the fund, and their compensation was linked to the performance of the strategy, with no fixed fee depending on AUM, thus making possible an alignment of interests between managers and investors, something that is very common in most of hedge funds that exist today.

However, by taking long and short positions, as well as by increasing the degree of leverage, the strategy carried a higher risk for investors compared with traditional funds distributed at that time. This problem was known by Jones, and he tried to solve it by an optimal stock selection. At the beginning, he thought he was as a great stock picker but, nevertheless, a poor predictor of market timing, hence always tried to remain market neutral through a combination of long and short positions. Basically, his goal was not to accurately predict market timing, just because he was convinced that it was virtually impossible, but to hit with the stock picks. In this regard, it must be said that Jones’ philosophy was right, as certain studies show that “not only mutual funds were on average not able to predict security prices well enough to outperform a buy-the-market and-hold policy, but also that there is very little evidence that any individual fund was able to do significantly better than that which we expected from mere random chance (Jensen, 1967)”. In fact and, looking at data, his strategy was tremendously successful, as demonstrated by the fact that, in Jones’ 30 years track record, only in 3 years he achieved negative returns.

Shortly afterwards and as his son said, Jones realized that he was not a really good stock picker, so he recruited other managers to carry out this task while he focused in other issues related to business development, thus giving birth to the first multi-manager hedge fund. With this change, Jones shifted from a general to a limited partner.

With the pioneering strategy implementation, Jones was able to attract a large number of investors motivated by what in today's terminology is known as a strategy of double alpha, as it allowed to make money both by long and short positions, in the same way that it was possible to generate additional returns through a possible expansion of the spreads between dividends paid and payable, or with the movement of exchange rates, always considering a conservative investment approach.

After more than 15 years managing the money of his investors in which he was able, not only to outperform the market, but to almost all existing mutual funds at the time, Jones earned a great reputation and became known by the general public following an article in Fortune magazine written by journalist Carol Loomis in 1966, in which it was spoken for the first time in print of the term hedge fund, which was used to classify

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13 The article can be found in the following link: [http://www.awjones.com/images/Fortune_-_The_Jones_Nobody_Keeps_Up_With.pdf](http://www.awjones.com/images/Fortune_-_The_Jones_Nobody_Keeps_Up_With.pdf)
Jones’ investment vehicle on a comparative carried out between Jones’ fund and the major funds of the moment. On that comparison, which is shown in the following graph included in Loomis’ article, it became clear the overwhelming superiority of Jones’ fund in terms of profitability, having achieved a return of over a 400% in the period between 1960 and 1965.

**Figure 4: Performance of Alfred Jones’ hedge fund against Dow Jones & Fidelity Trend Fund**

![Graph showing performance comparison](http://www.edmond-de-rothschild.ch/know-how/asset-management/investment-funds/funds-of-hedge-funds.aspx)

Due to the article published by Loomis, the popularity of Jones began to grow exponentially, which lead to the creation of a large number of similar investment vehicles designed to implement the same methodology in order to outperform the main mutual funds that existed at the time. In fact, even some of Jones’ employees decided to start a solo career and launched their own funds in the same way that many other prominent figures, such as Warren Buffet or George Soros, created different investment vehicles designed to manage not only their personal wealth, but also the money of any investor. Also during these years, particularly in 1969, Rothschild launched the first fund of hedge funds in history, an extremely innovative product at that time that allowed investors to diversify the risks of investing in this type of alternative investments, as well as to gain exposure to different strategies implemented by the most famous managers of the moment.

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During all these years, the number of hedge funds increased greatly, particularly in the US, due in part to the growing demand of investors for these products, as they allowed stable returns but with a conservative approach. However, even though Jones’ strategy was simple in theoretical terms, it wasn’t easy to put into practice, so many managers, and their investors, saw how their funds plummeted as a result of entirely wrong investment decisions. This fact can be explained, in part, because many managers embarked on the creation of hedge funds attracted to easy money with little or no experience in basics of asset management, such as minimal mathematical knowledge, risk management policies or business valuation, among others. Furthermore, and taking advantage of the bullish market momentum that took place in early 60s, many managers chose not to cover their long positions in order to achieve greater profitability, and were caught in the downward cycle that took place later, and that was consolidated in early 70’s, causing them huge losses.

These years in which hedge funds saw how their returns plummeted due to the performance of the US equity market meant a great loss of confidence by investors which, due to the huge losses incurred, began to move their money to traditional investments, which led to a major setback in the hedge fund industry.

### 2.2.2 The recovery and subsequent development of the industry (1975-1990)

After a hard period in which hedge funds suffered heavy losses as a result of bad strategies implemented by a large number of managers, the industry began to show signs of recovery in the late 70s and early 80s.15

In these years, hedge funds began to take a global character, due to the launch in 1974 of the "European Fund and Asset Management Association" (EFAMA)16, the representative association of the asset management industry in Europe, which joined to various subsequent initiatives, although minor, in other European countries. Furthermore, in the same year, it was launched the "Commodity Futures Trading Commission" (CFTC)17, an American agency in charge of overseeing, in order to protect the interests of market participants, US futures markets. Among its main functions are trying to prevent and detect any fraudulent activity, abusive practices, or systemic risk as a result of irrational use of derivatives, and ultimately, to ensure transparency and competitiveness of US futures markets.

Later, in 1984, it was founded Tremont Partners, a firm specialized in following major hedge funds and that eventually became a fund of funds that has not been without

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16 For more information on the association, you can visit its website at the following link: http://www.efama.org/SitePages/Home.aspx
17 To find out more about the agency, please visit its own web page: http://www.cftc.gov/index.htm
controversy in recent years\textsuperscript{18}. In its inception, the firm identified, through a survey conducted nationwide, 68 hedge funds, which was a very sharp decline compared to the number of existing funds just a couple of decades ago, showing again the strong fall that suffered the industry as a result of the bearish momentum of the market during the 70s.

However, the industry began to recover during the 80s supported, in part, by the popularity achieved by prominent figures such as Julian Robertson who, unlike many other managers, decided to use the same tools used by Jones, such as short sales and leverage, to launch a new type of strategy which, by then, it was new. This strategy, very innovative at that time, was called global macro, and consisted of taking positions in certain financial assets, particularly currencies and, to a lesser extent, stocks and bonds, based on an analysis of both the macroeconomic situation and the political conditions. In short, the manager makes predictions based on the flows of funds between countries; interest rates forecasts; economic drivers; geopolitical aspects; and in general, any aspect related to economic theory.

Julian Robertson's success was impressive, achieving in its early years an annualized return of over a 40\%, derived in large part from its success at predicting the end of the upward trend of the USD against the JPY and European currencies, which led him to take long positions in several different currencies other than USD, even sometimes indirectly through derivatives, which began to be created and largely developed at that time, such as stock options or even futures. With this strategy, he achieved a significant gain that helped him to earn the respect and admiration of a large number of investors from around the world.

The performance of the Tiger fund between 1980 and 1999, as well as the returns achieved by the S&P500 and the MSCI, are shown in the following chart\textsuperscript{19}.

\textsuperscript{18} The current Tremont Group was a seed fund for Madoff Investments, and was ordered to pay one billion USD in cash after being convicted of collaborating with Bernard Madoff in his Ponzi scheme. Basically, they charged a 2\% fee for sending money of their investors to Madoff Investments, which apparently was in charge of managing it, until the fraud was demonstrated. For more information, please read the following link:

\textsuperscript{19} Strachman, D.: \textit{Julian Robertson: A Tiger in the Land of Bulls and Bears}, Wiley, 2004
The impressive results of Robertson brought back the attention of investors to the industry, due in part by the fact that there were many other strategies different than the one implemented by Jones that also achieved higher returns than the market or than the traditional asset management industry. In fact, the strategy launched by Robertson in his charismatic "Tiger Fund" had little or no resemblance to the one developed by Jones, given that usually Robertson didn’t cover all his exposures, in contrast to Jones, who always tried to maintain a neutral position to the market or, in other words, a very low correlation at all times to maintain stable returns regardless of market timing.

However, not all were good times for managers during the 80s, because in 1987 a large number of stock exchanges in the world, led by the NYSE, collapsed, thereby causing huge losses to many of the hedge funds existing at that time, including the Robertson’s fund, though they managed to soar shortly after and minimize, to some extent, the situation.

2.2.3 The boom of the industry (1990-1997)

During this period, both the number of funds, as well as the volume of assets under management, of the hedge fund industry grew largely. In this regard, certain studies concluded that the “the industry was characterized by high attrition rates of funds and a low covariance with the U.S. stock market (Brown, Goetzmann & Ibbotson, 1999)”.

Also and, because of the attention of investors from around the world was again put into hedge funds, among other things because they managed fairly correctly the crisis of the late 70s, where markets suffered major setbacks, as well as due to the fact that they achieved very impressive results during the 80’s, there were implemented new private initiatives to represent the hedge fund industry. Among these initiatives, the most

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**Chart 2: Tiger Fund's performance Vs S&P 500 and MSCI**

Source: Compiled by author based on data of Strachman, D.: Julian Robertson: A Tiger in the Land of Bulls and Bears, Wiley, 2004
important one was the "Alternative Investment Management Association '(AIMA)^{20}, a
non-profit organization created in 1990 with the primary objective of being the main
representative of the global hedge fund industry; to ensure its expansion and
development; to act as a leader and unique voice of members; as well as to promote
good practices, transparency and educational resources. Along with AIMA, it was also
launched at that time the "Managed futures Association" (MFA)^{21} in 1991, with similar
objectives; and the "Hedge Fund Association" (HFA)^{22} soon after, in 1996. However, it
must be said that there are currently a great number of associations with similar
objectives, but without the importance of the ones mentioned above.

Over the years, hedge funds, and particularly its most successful managers, began to
gain the admiration of a large number of investors across the globe. Particularly
important for the development of the industry in the last two decades were certain funds
that implemented macro strategies that were hugely successful in which, due to certain
positions that even today are studied in the most prestigious business schools of the
world, their managers earned a great reputation worldwide.

Among these positions, it must be highlighted the bet that George Soros made against
the sterling pound (GBP) through its world-renowned "Quantum Fund^{23}, established in
1973 with partner Jim Rogers. In this case, Soros, like other speculators from around the
world, based his performance on the premise that interest rates in the UK had been
inflated by the British government to keep the exchange rate within the fluctuation
range established by the European Exchange Rate Mechanism (ERM), in order to stay
within it. The reasoning was based on the assumption that the British government
sought to maintain an exchange rate of 2.7 DEM per pound without considering the fact
that the country had low interest rates in contrast to the high inflation suffered by the
country, several times higher than that of Germany. This aspect was seen by Soros who,
based in the assumption that the British government would be unable to maintain that
rate, sold short a great volume of GBP, something that, boosted by other short positions
taken by several investors, precipitated the exit of the pound of the ERM in order to
avoid, at all costs, higher losses than the ones already suffered. In addition, Soros was
also right when he bet against the Thai Baht, as he was able to correctly predict the
financial crisis that hit hard at a number of Asian countries in 1997, some of which

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^{20} For more information on the objectives, principles, members who make up the association, regulation,
and even educational resources, it is recommended to visit the website of the association through the
following link: http://www.aima.org/

^{21} Nowadays known as "Managed Funds Association". For further information on the MFA, you can visit
its website through the following link:
http://www.managedfunds.org/

^{22} http://www.thehfa.org/

^{23} The Quantum Fund has remained active until 2011, when the fund was closed to new investors and the
funds of investors were returned. Soon after, it was transformed into an endowment (Quantum
Endowment) that is in charge of managing the personal wealth of the Soros family. Soros has been also
involved in philanthropic activities, which can be seen at the following link:
http://www.georgesoros.com/
years later would be known as the 'Asian Tigers', such as South Korea, Singapore, Thailand, Indonesia, Malaysia or Philippines.

2.2.4 Fall and new booming of the industry (1997-Now)

The turbulent economic situation of emerging economies in the late 90s came with a severe blow in the hedge fund industry, which tried to take advantage of certain situations to please investors but, in many cases, with significant errors that led to huge losses even in those hedge funds considered a few years earlier as part of the most successful within the industry

The first of the events that caused enormous problems to a large number of hedge funds were the crises in certain Asian economies in 1997, which even put on alert about a possible crisis worldwide. This crisis had its origins in Thailand as a result that the Thai government was unable to maintain the exchange rate of its currency, the Thai Baht, relative to the US dollar at desired levels, prompting a sharp devaluation of the local currency due to insufficient foreign exchange reserves at his disposal to artificially maintain that rate. This aspect, was added to the problem of the external debt that had the country which, combined with the strong devaluation of the currency, led the country to bankruptcy. All this caused panic among investors that eventually spread to other Asian economies, which saw how the demand for their products plummeted due to the loss of confidence of investors on their economies.

Particularly hit were, with Thailand, South Korea and Indonesia, but the crisis also had effects, though less harmful, in countries like Malaysia, Hong Kong, and the Philippines, among others, as well as in China, Taiwan and Singapore. In the latter cases, the loss of confidence caused a drop in demand that impacted negatively on the interests of their economies, which are export oriented.

The Asian Crisis resulted in major problems, as foreign debt as a percentage of GDP soared, prompting the International Monetary Fund to tackle the situation by an aid of 40 billion USD that was primarily aimed at dealing with stabilizing the situation in the region, thereby trying to attract investors to the area again. In fact, it can be said that the success was overwhelming, as in the following years the region was able to achieve the highest economic growth rates in the world, something that, even today, remains a reality, supported in part by the large number of investments from abroad that were conducted in the region due to its high level of competitiveness. This phenomenon was applauded by a large number of institutions, among which were the International Monetary Fund and even the World Bank, and became known as the Asian miracle due

25 Known also as the “Asian Contagion”.
to the radical change experienced by the economies in the years following the crisis suffered by many of them.

As a result of the Asian crisis, many hedge funds suffered huge losses due to certain bets in assets denominated in greatly devalued currencies, but nevertheless some others, as they were able to predict adequately the problems that sooner or later would eventually emerge, achieved high returns, such as the Quantum Fund of George Soros. However, it must be said that certain studies of the “dynamics of hedge funds and Asian currencies suggest little evidence that hedge fund managers as a group caused the crash (Brown, Goetzmann & Park, 1998”). It is also important to note that the Asian crisis is regarded as the germ of the crisis that some years after hit the United States, which was none other than the so called dot com bubble. This was because, as a result of growing concerns in the global economy due to the Asian problems, many developed international markets suffered heavy losses, led by the NYSE. To try to avoid greater losses, the Fed decided to lower interest rates to stimulate economic growth, prompting many companies to start carrying out investment projects not undertaken before because of the higher financing costs, favoring with it the bubble that explode and that ended up affecting to a large number of hedge funds that were doomed to extinction.

The second of the important events that caused a sharp decline and, largely, some discontent and suspicion of international investors regarding the hedge fund industry, was the Russian Crisis that started in 1998. The main problems presented by the Russian economy, and that eventually ended up causing one of the most severe major crisis that the country has suffered throughout its history, were none other than the very high exchange rate of the ruble, artificially maintained by the Russian government against other foreign currencies to try to inject positivity into the population; the huge fiscal deficit problem that presented the Russian economy; as well as the ever decreasing productivity of major industries of the country due to the inability to cope with technological reforms that were entirely necessary.

Also, the problems increased because of the enormous cost of the Chechen War that took place between 1994 and 1996, which impacted directly to the already battered Russian accounts; as well as the impact that had on the Russian economy the fall in global demand, which had a significant impact on the price of oil and non-ferrous metals produced in Russia, both aspects caused by the Asian Crisis of 1997.

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27 Also known as the Russian Flu or the Ruble Crisis.
28 Stone, D.: A Military History of Russia: From Ivan the Terrible to the War in Chechnya, Praeger, 2006
29 Non-ferrous metals are those that do not have in their composition significant amounts of iron. The most important ones are aluminum, copper, lead, nickel, titanium or zinc, among many others. Given that the vast majority of them are alloys used in a great number of industries, they have a high value and therefore a higher cost to the producer, which affects the price.
All the above problems cornered the Russian economy, forcing their leaders to carry out drastic measures in order to prevent the increasing capital outflow. Among these measures, they rose interest rates paid on bonds issued by the Russian government in the short term to 150%, an extreme and unsustainable level for any economy in the world, that led to the smooth rescue of the Russian economy by the International Monetary Fund and the World Bank which, with contributions from its members, made available to the Russian government 1998 a joint fund of more than 22,000 million. This package was used to transform many of the obligations of the Russian government into short-term Eurobonds with a longer duration, in order to minimize the big problem that would have meant coping with the contractual obligations of the Russian economy with investors from all over the world, among which were a considerable number of hedge funds.

However, the aid that the Russian government received was not enough to tackle the big problems of assuming the service of the debt, which continued to grow at a high rate, in the same way that it was unable to maintain the ruble exchange rate within the desired fluctuation band, which led to a large number of investors selling large amounts of Russian currency and assets denominated in rubles, thereby putting more pressure on the domestic currency.

Also and, in a last desperate attempt to keep the ruble exchange rate within acceptable levels, the Bank of Russia spent all its reserves and finally was forced to accept the sharp depreciation of the ruble, as well as a default on its debt as a result of the inability to cope with the enormous obligations. Moreover, these problems increased with the fall of several Russian banks; an exponential increase in inflation; huge problems in the agricultural sector as a result of the decline in state subsidies aimed to maintain a certain competitiveness with the rest of the world; as well as, more importantly, an unprecedented political crisis, which caused a huge loss of confidence by the Russian population in the government of Boris Yeltsin.

Both crises had a negative impact in a great number of developed countries, including the United States. The following graph shows the evolution of the S&P 500 before, during and after the crises analyzed.

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30 Known as GKO. You can consult the volume of such instruments and other securities issued by the Bank of Russia on its website at the following link: http://www.cbr.ru/eng/archive/?Prtid=gkoofz_operative

The Russian crisis hit a large number of hedge funds, among which stands out above all others "Long Term Capital Management" (LTCM). This hedge fund, founded in 1994 by a number of distinguished economists, among which there were some Nobel laureates such as Robert Merton and Myron Scholes\(^\text{32}\), was considered one of the largest and most successful in the world at that time, due to the impressive returns achieved in its first years of life.

The strategy launched by the fund managers, in which there were also former employees of major investment banks at that time, had nothing to do with the strategies put in place by Alfred Jones and Julian Robertson, given that the returns came through various operations framed within what is known as fixed income arbitrage\(^\text{33}\). This strategy, which will be examined in greater detail in the section on the various strategies implemented by hedge funds, fall within relative value strategies, which seek to exploit inefficiencies between prices of financial instruments that may appear on the market.

\(^{32}\) Robert Merton and Myron Scholes became world famous for being the authors of the Black-Scholes equation, along with Fischer Black, which enabled them to win the Nobel Prize in economics in 1997. Even today, the model is being used as the basis of proprietary models developed by leading investment banks in the world designed to evaluate a large number of derivative products.

\(^{33}\) It must be clear that the term arbitrage in this context does not refer to the possibility of earning a profit without any risk, as may happen in a venue arbitrage situation, but in trying to exploit inefficiencies that may appear in the market between the prices of some instruments.
The basis of these strategies is nothing that, in theory, two instruments with similar characteristics should trade at a similar price or, in other words, if there are any price differences, these differences could not be maintained for long and, therefore, prices would eventually converge sooner or later. In this sense, the main objective of the strategy would be to find financial instruments with similar characteristics but trading at different prices, so that, in a bid to the convergence of prices, the manager will take a long position in that instrument trading at the lowest price and a short one on the one priced at a higher price. With this combined position, the manager expects to make money due to a reduction in spreads. In addition, it must be said that this strategy, as a result of very small differences that may exist in the market between the fair price of an asset and the price at which trades, requires a high degree of leverage to maximize returns, so it is more risky than other strategies.

The theory put into practice by the experts of "Long Term Capital Management" soon began to work, achieving spectacular returns in the early years of the fund, supported largely by the extensive knowledge of fixed income products of those responsible for implementing the strategy. On the other hand, and due to the increasing confidence of investors from around the world, they also launched other strategies aimed to exploit inefficiencies that may exist in companies facing a large number of corporate events, although these strategies, known as risk arbitrage, were not the most important ones within the fund.

However, a wrong bet ended with the fund due to the huge losses. This bet was based on the belief that the large spreads that existed at that time between the yields of debt instruments in emerging economies, particularly Russia, and developed economies, would eventually come to an end as a result of the theoretically convergence between economies. In other words, economists of LTCM were convinced that, sooner or later, the Russian economy would become a developed economy, which, even today, still didn’t happen.

Based on their predictions, the managers of "Long Term Capital Management" bought Russian government bonds and shorted US treasuries, with the conviction that spreads would disappear sooner or later. This never happened because, as a result of the already mentioned Russian crisis of 1998, many investors panicked and began selling Russian bonds due to the increasingly real risk of default, to then move their funds to the safer US bonds treasuries\(^{34}\). In addition and, in order to increase profits, the fund operated with a high degree of leverage, of even around 30 times\(^{35}\), which further aggravated the situation.

\(^{34}\) This effect whereby investors move their investments from riskier to safer assets is known as "flight to quality" effect. It usually occurs in situations of uncertainty in the market, and even in those moments when investors decide to reduce positions in instruments with greater volatility and to increase their positions in more conservative assets.

On the other hand and, along with the above mentioned disastrous bet, another relative bet on equities that was made based on the drop in oil prices, caused by the Asian crisis of 1997, increased the losses of the fund. In this case, the managers thought that the premium of more than 10% that the market was giving to Royal Dutch over Shell would eventually disappear, something that did not happen and that caused them heavy losses because that premium continued growing to a peak, thus impacting negatively on the combined long and short position in Shell and Royal Dutch.

The advent of the disastrous consequences that came with the Russian crisis hit squarely in the strategy implemented by the experts of LTCM, who had planned, and so it was indicated in the fund’s brochure distributed among qualified investors, that a more than a 45% in a month loss was an event of 10 standard deviations or, in other words, an unlikely scenario even in the history of the universe. However, the scenario took place and the huge losses incurred by the fund caused a large number of redemption requests by investors that, frightened by the situation, tried to recover the little money they still maintained in the strategy. All this ended up with the fall of the fund, which was rescued by a large number of financial institutions around the world that contributed with more than 3.6 billion USD, to avoid further losses and to put in danger the financial stability of several institutions from around the globe.

Both the Asian crisis of 1997 and the Russian crisis of 1998 had a negative impact on many of the developed economies, including the United States. In fact, they are regarded as the germ of the crisis in the technology sector that took place a few years later, which caused the disappearance of many hedge funds.

In the late 90s and, as a result of the existing cheap financing in the United States, a large number of technology companies emerged, many of them relating to Internet services, which began to go public because of the fascination that caused their activities among investors worldwide, as well as due to the interest that many venture capital funds that had financed a large number of these companies had to recover their investments with great returns. This seduction was caused largely by the novelty of the activities carried out, which resulted in what later became known as the new economy, allowing many of them to see how their shares began to soar to unknown heights, regardless of the fact that their financial results did not justify in any way that demand of shares, and thus creating a bubble of enormous dimensions.

36 Including giants like JP Morgan, Goldman Sachs, Morgan Stanley, Salomon Smith Barney, Deutsche Bank or UBS, among others.
37 If you want to delve into more detail about Long Term Capital Management and other aspects concerning its partners, strategies and even specifics of the trades that led to its collapse, the reading of the following book is recommended: Lowenstein, R.: When genius failed, Random House, 2000
The situation was exploited by a large number of hedge funds that were able to take positions in technology stocks in early stages, or even in their IPOs, that shortly after were sold after achieving very high returns. In this regard, it must be said that “hedge funds were riding the technology bubble, rather than attacking it (Brunnermeier & Nagel, 2002)”. However, not all funds were so lucky, because many of them were not able to understand the value of technology companies in which they had invested, showing in many cases poor financial performance, and coupled with the fact that there were times when the demand for securities of certain companies was based on false stories about business models and unrealistic estimates of future earnings. This, finally ended up with the bursting of the bubble in 2000, which resulted in the disappearance of a large number of technology companies, either due to bankruptcies or because they were acquired at bargain prices by other technology companies, shortly before they were admired by a large number of investors from around the world.

Among the hedge funds that were affected largely due to the bubble in technology companies, stands out above all the case of the Tiger Fund of Julian Robertson. In fact, it is rather curious that the cause of the fall of a fund that, until then, was considered one of the greatest exponents of the hedge fund industry, was not a mistake on the premise on which Robertson relied on when making certain positions, but in the fact that the market took a longer time to correct than the time the fund held.

In this case, Robertson felt that the valuations of a large number of technology companies were greatly inflated or, in other words, he anticipated the enormous bubble, so he took short positions in plenty of technology stocks. However, these positions ended up with high losses due to the fact that the bubble lasted more time than Robertson thought, prompting many investors to unwind their positions in the fund, just because they saw how their funds were reduced, at the same time that investments of other investors who had bet on funds that were long tech stocks grew exponentially. All this precipitated the fall and subsequent end of the fund because, as Keynes said, “the market stayed irrational longer than Robertson was solvent. 39

The effects of the internet bubble can be seen in the following graph, which shows the drop of more than an 80% of the NASDAQ 100 index once the bubble came to an end in 2002.

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39 Although the Tiger Fund came to an end, many of the employees of Robertson launched their own funds and some still exists today, being considered part of the elite group of best hedge fund managers in the world. Within these, known as "Tiger cubs", are Andreas Halvorsen (Viking Global), Stephen Mandel (Lone Pine) or John Griffin (Blue Ridge Capital), among others.
Another similar case, although with important differences, was the Soros Quantum fund, which also suffered heavy losses due to the technology bubble. Just as Robertson, Soros realized that there was a huge bubble in the internet sector, but in this case he tried to take advantage of the bubble by taking long positions in a large number of companies to sell them at higher prices shortly thereafter. However, the bubble precipitated at a time in which the fund's exposure to various technology companies remained very high, thus causing severe losses. However, and although the losses were substantial, the fund remained alive.

Due to the turbulent era that suffered the hedge fund industry as a result of the various crises that took place in the late 90s and in the first decade of the XXI century, new initiatives were launched worldwide with the aim of protecting investors. Among these initiatives, particularly important was the creation in 2001 of the "Financial Services Authority" (FSA)\(^{40}\), with the aim of promoting the stability of the UK financial system; protecting the interests of all investors; minimizing potential frauds; and enhancing transparency and market confidence. Also, in 2001 was launched an initiative initially known as the "Committee of European Securities Regulators" (CESR), which changed its name in 2011 to the "European Securities and Markets Authority" (ESMA)\(^{41}\), with

\(^{40}\) For more information on the FSA, please visit its own website: [http://www.fsa.gov.uk/](http://www.fsa.gov.uk/)

\(^{41}\) If you want to delve further on the activities, organization and objectives of the ESMA, you can visit its website at the following link:
the aim, among other things, of assessing potential threats to the financial stability that may arise due to some macroeconomic issues.

During this period of significant growth experienced by the industry, which wasn’t exempt from situations in which there was some contraction as a result of the heavy losses caused by bad investment decisions in many hedge funds, a large number of managers specializing in funds of funds emerged. These funds of funds saw how their assets under management grew largely due to the important opportunities for diversification that they allowed to investors, as well as because those managers were specialized in the not simple necessary due diligence process when carrying out an investment in any hedge fund with the maximum guarantees. Also, those funds of hedge funds allowed investors to make bets on the different strategies implemented by the most important hedge funds, which is something to consider, as not all the funds had a multi strategic approach. In addition and, as some studies concluded, “funds of hedge funds attrition is substantially lower than that of hedge funds, but shows a similar acceleration (Amin & Kat, 2002)”.

Along with the development of hedge funds, the industry was spurred in 2002 due to the UCITS III directive, which allowed any UCITS fund sold in the European Union to implement alternative strategies if desired, thus making the flexibility of this type of products to grow greatly. This led to an increase in transparency of alternative investments and thus, a large number of investors decided to invest their funds in hedge funds. In addition, the hedge fund industry began to grow greatly in number of funds and assets under management, reaching the not inconsiderable figure of 2082 billion dollars in 2014.

However, and as it happened before at the beginning of the new millennium, in 2007 started a new economic crisis that, this time, had a brutal impact comparable, as a large number of renowned economists from all over the world noted, to the Wall Street Crash of 29. The effects of the crisis can be seen in the following graph, which shows the drop of more than a 40% of the S&P500 in just a few months between 2008 and 2009.

http://www.esma.europa.eu/

42 In simple terms, a UCITS fund refers to any fund that is based in the European Union. These funds are distributed to investors under a harmonized regulatory regime among the EU countries, thus reducing costs and increasing transparency.

43 Sometimes presented as 2.82 trillion USD. For more information on AUM by strategies, it is recommended to visit the following link: http://www.barclayhedge.com/research/indices/ghs/mum/HF_Money_Under_Management.html
This crisis, which was accompanied by deep economic recession and the loss of millions of jobs across the entire planet, as well as a huge loss of confidence in a large number of financial institutions, caused huge falls in the major financial markets of the world, which impacted heavily on many hedge funds. Moreover, the problem increased due to the huge outstanding volume of credit derivatives, mainly CDOs, whose yields were dependent on the cash flows generated by the assets that were used in the structure. The problem came because many of the CDOs were structured by using subprime mortgages, which carried a high risk of not being repaid, plus the fact that various rating agencies gave high credit ratings to these instruments obviating the high possibility of default. This aspect, caused huge losses to investors from around the world, in which a large number of hedge funds were affected, although some others took advantage of the situation to achieve significant gains, as they were able to predict the default and took short positions based on this premise. However and, in this regard, it must be said that recent studies concluded that hedge fund “alphas were positive during every year of the past decade, even during the recent financial crisis (Ibbotson, Chen & Zhu, 2011)”.

Source: Compiled by author based on data from Barchart.com
The international financial crisis of 2007, due to the importance of it and the impact that it had on millions of people, brought a battery of measures aimed to prevent a similar situation in the future. Many of the harsh adjustment measures and even the new regulation affected the financial sector, which was considered as the main cause of the crisis. Among these, were the adoption of different rules by the SEC in the United States, aimed at forcing those advisers registered with more than $150 million in assets under management\(^{44}\), to report complete portfolio information in order to facilitate monitoring; assessment of potential risks; as well as to increase transparency\(^{45}\).

Also, in 2012 went into effect the "JOBS Act\(^{46}\)", aimed to facilitate to a large number of small businesses to raise capital, and thereby to create new jobs. This act is of great importance for the industry of hedge funds because, before the act came into effect, hedge funds were forbidden to conduct any kind of advertising directed to the general public. However, at present, hedge funds are entitled to advertise in any of the traditional media, such as newspaper, television or radio, although they can only accept funds from those investors which are accredited\(^{47}\). This modification of existing legislation has been very favorable for the industry, as it has allowed many hedge funds to grow greatly in assets under management because they have been able to reach a larger number of accredited investors. However, the SEC still oversees much of the advertising that hedge funds made available to the public in order to prevent the use of misleading information aimed to deceive investors with limited financial knowledge.

In recent days, the hedge fund industry has reemerged strongly due to the fascination that these investment vehicles still cause to investors from all over the world. This has already resulted in the creation of a large number of funds around the globe, as well as in the appearance of numerous investment strategies, many of them based on taking positions in new highly complex products and in quantitative analysis that years ago was virtually impossible to achieve due to the limited computing power, that have little or nothing to do with the original idea of Alfred Jones.

\(^{44}\) More information on the law in the SEC website at the following link: http://www.sec.gov/rules/final/2012/ia-3308-secg.htm

\(^{45}\) The report is made through the Form PF (available at http://www.sec.gov/rules/final/2011/ia-3308-formpf.pdf), as well as with the Form 13F (http://www.sec.gov/about/forms/form13f.pdf), which is mandatory for all those funds with more than $100 million in assets under management and in which the various positions held by the fund are detailed.

\(^{46}\) Acronym for "Jumpstart Our Business Startups". You can access to an online version of the law on the SEC website at the following link: https://www.sec.gov/spotlight/jobs-act.shtml

\(^{47}\) The SEC defines an individual as an accredited investor if he/she has an annual income of more than $200,000 (or 300,000 USD considering the income of the spouse/husband), or a net wealth of more than $1 million excluding his/her family income.

http://www.investor.gov/news-alerts/investor-bulletins/investor-bulletin-accredited-investors#.VIMs6f50zoo
However, the size of the industry, which has assets under management of just over 2.82 trillion in the third quarter of 2014, is still very small compared with the assets managed by traditional financial institutions, such as banks or insurance companies, and even with assets under management of traditional asset managers. This aspect and, in contrast to what many people even today continues to believe, along with the fact that hedge funds often do not show a high degree of leverage compared to other corporates, suggests that, for the moment, “the hedge fund industry do not poses in the immediate future any systemic risk that might end up jeopardizing the global economy (Hurtado, 2004)”.

When analyzing the key characteristics of the hedge fund industry and, along with the aforementioned 2.82 trillion in assets under management, note that there is a high concentration in terms of geographical location of assets under management, being the undisputed leader the US, with almost half of the assets managed of the industry, followed by the UK. In addition, it’s important to note that still exists a huge gap between some hedge funds, which manage assets above one billion dollars as a result of the successful results achieved by their portfolio managers in several of the investment strategies implemented, and others with lower track record struggling to survive to the industry giants. In this regard, it must be said that some studies concluded that “a limited group of mega hedge fund firms manage the bulk of the assets in the industry, which implies that the assets of the hedge fund industry is concentrated in the hands of a small number of mega management firms with rising opacity as their AUM increases (Edelman, Fung & Hsieh, 2012)”.

The above mentioned aspect makes really difficult for a great number of managers of small to medium funds to compete on equal terms with large funds, because of the comparative advantages enjoyed by the giants of the industry, due to their greater volume of assets under management, when negotiating prices with the sell side; as well as because of the massive resources, both human and technological, that large funds have and that help them to make investment decisions and to implement the required strategies in the most accurate way. However and, in this regard, it must be noted that some studies concluded that “large hedge funds grapple with significant diseconomies of scale, and consequently underperform small hedge funds, ex-post (Teo, 2009)”.

In terms of strategies, fixed income strategies have the higher volume of assets under management, followed by event driven strategies, and by those designed to take advantage of all opportunities that may arise in emerging markets. However, there are also other strategies that manage a high volume of assets, as can be seen in the following table.

48 Source: https://www.hedgefundresearch.com/?fuse=products-irglo
49 Some notable examples of managers who are known around the world because of their superior returns are Ray Dalio (Bridgewater), John Paulson (Paulson & Co.), James Simons (Renaissance Tech.), Seth Klarman (Baupost) or Alan Howard (Brevan Howard), among others.
Finally, it must be said that it is almost impossible to predict how the industry will evolve in the future, but a fact is that today hedge funds, particularly the most recognized worldwide, enjoy a good health in part due to the higher returns achieved compared to the ones of the traditional asset management industry. Furthermore, there has been an increase in the number of foundations, endowments, institutional investors, and even individuals with significant assets, relying on hedge funds due to their higher returns and diversification possibilities, thus making us optimistic about the future of the industry, at least in the short and medium term.

Some of these foundations/endowments, which have a volume of assets under management comparable even to the largest hedge funds, are the ones of certain academic institutions considered as the most prestigious in the world, such as Harvard, Yale or Stanford, among others.
2.3 OPERATING STRUCTURE

As mentioned before, hedge funds have complex operating structures with the main objective of increasing the efficiency and thereby provide them with a significant competitive advantage over traditional mutual funds. Also, included in these structures\textsuperscript{51}, there is a large number of service providers dealing with different tasks that, due to the small size of hedge funds compared to other financial institutions, are outsourced in order to save costs.

2.3.1 Legal structure

Given that the vast majority of hedge funds existing in the world are based in the US, it is essential to first understand the legal structure that usually have this type of investment vehicles in the United States, to then extend the analysis to the rest of the world.

In the United States, hedge funds are usually structured as a "Limited Partnership" (LP) or as a "Limited Liability Company" (LLC). The main common feature of these organizations, which can explain why hedge funds choose these structures, lies in the fact that they don’t have any tax obligations at corporate level, unlike the vast majority of companies, but taxes are transferred to the fund participants, thus providing this type of investment vehicles a more efficient tax status. Basically and, in other words, the cost of capital of a hedge fund is reduced by such legal structures. In addition, note that both the LLC and the LP present a great level of flexibility when defining the rights and responsibilities of partners through different agreements that, generally, remain in effect until they are amended again unanimously.

However, and regardless of certain similarities that both structures have, there are certain differences between both that must be understood.

- **Limited Partnership (LP):** In this case, there will be general partners and limited partners. The general partners, which are usually one or a very small number of persons, either natural or legal, are responsible for managing the business and to take over the day to day operations. These partners are entitled to receive part of the revenues generated by the partnership and, what is more important to note, they are liable with both their contributions and personal wealth for the losses and debts that may arise. That’s why the general partner tends to be a Limited Liability Company.

\textsuperscript{51} Lhabitant, F.: Handbook of Hedge Funds, Wiley, 2006
On the other hand, the limited partners are those who do not participate in managing the business or in the dividend distribution. That’s why they are generally not liable for all the partnership’s obligations, unless there are special clauses in the partnership agreement, so their risk is limited to their capital contribution.

- **Limited Liability Company (LLC):** In this structure, the participants are called members, which may be simple or managers. The rights and responsibilities of each are often defined in the operating agreement of the structure although generally and, unless otherwise specified, both are entitled to both the distribution of profits and running the business. However, it may be the case in which the management of the structure is in the hands of some manager members, but only if it has been arranged in this manner.

The most important difference of this type of structure with respect to Limited Partnerships lies in the fact that none of the members who compose it, either simple or general, have unlimited responsibility for the debts or losses of the entity, but it is limited solely to their contributions. This aspect explains why this type of structure is the favorite one for major hedge funds operating within the borders of the United States but, however, all those hedge funds with a small to medium size usually opt for a Limited Partnership structure, in which the general partner is a LLC, for the simple reason that a LP structure has a lower cost of creation, as well as lower requirements when reporting activities.

Both legal structures described above, as discussed previously, do not carry any tax obligations at corporate level, but those obligations are transferred directly to their members or partners. In addition, US investors don’t face any withholding on distributions of the fund, something that, however, does occur in the case of investors from other parts of the world. Therefore and, to make investments in hedge funds more attractive, many funds choose to register outside US borders, usually in tax havens, in order to gain access to a number of important advantages that allow them to increase their efficiency and thereby make them more attractive to many investors. Some of these advantages are very low or even zero tax obligations; high confidentiality; lower requirements in terms of transparency; as well as a relatively small cost of both creating and maintaining the structure, among others.

However, and given the large number of attractive countries in which funds can establish the structure, hedge funds often consider several aspects when making the decision such as the reputation of the country; the quality and availability of leading service providers; costs or existing regulations in the country affecting the activities of the fund, among many others.
2.3.2 Organizational structure

The organizational structure of a hedge fund is relatively simple when compared with a traditional asset manager but, nevertheless, within it there are different participants that must be known. In addition and, as a consequence of the considerable increase in recent years in the number of hedge funds all over the world, it has been developed a huge industry of service providers aimed to meet the demands of this type of investment vehicles that, ultimately, allow managers to focus exclusively on managing the fund and not in other low value added aspects, being all these services essential for running the business in the best possible way.

In addition, it must be said that the large number of existing service providers, which differ greatly in terms of service quality, usually forces hedge funds to perform a due diligence process in order to make a right decision based on both the quality of services offered and their price.

The different service providers of a hedge fund, which will be analyzed afterwards, are shown in the following figure.

**Figure 5: Hedge Fund’s Service Providers**

![Diagram of hedge fund service providers]

- **Fund sponsor/general partner**: The sponsor of a hedge fund is usually the individual who founded it. He is the head and in, almost all cases, is the main portfolio manager of the strategy. Usually, such individuals tend to come from

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the financial sector, either from investment banks, brokerage firms or traditional asset managers that, due to the limited flexibility and lower compensation offered by all those firms, have decided to establish their own fund.

However, there are occasions in which the general partner is simply a person with experience in asset management for purely vocational motives, or individuals with higher education, either PhD or MBA, that decides to set up a hedge fund after his studies in order to start growing slowly and to gain notoriety with the passage of time, as long as the results are good enough to draw the attention of the public. In addition, an important aspect to be considered is the fact that sponsors invest in the fund a large percentage of their personal wealth to align their interests with those of investors.

Along with all the above, it must be noted that, usually, the sponsor or general partner is solely responsible for managing the business and, thus, is paid a share of the revenues (the performance fee, which is usually 20% of profits), but usually only if the NAV of the fund at the end of the period is higher than the one of the previous period (a high water mark clause is usual in the vast majority of funds).

- **Investors/limited partners**: Along with the general partner, there is also a large number of limited partners or investors who usually have no right to participate in the management of the fund or to receive any percentage of the performance fee. This investor base consists primarily of institutional investors of all kinds, such as banks, insurance companies, asset managers or large corporations, as well as of high net worth individuals. Typically, investors in a hedge fund typically have a high degree of financial knowledge, hence they are considered professional or accredited investors.

- **Board of directors**: Although it is not mandatory nor exists in all the hedge funds on the market, some of them have a board of directors consisting of independent people with great prestige, either within the country in which the fund operates or internationally even though, however, they may also be invested in the fund to align their interests with those of the hedge fund.

The main objectives of maintaining a board of directors are to monitor that the investment policy and risk management procedures are applied correctly; to bring prestige, national and international visibility to the fund; to help rising capital among certain circles; to defend the interests of investors; as well as to supervise the various service providers hired by the fund, among other things.

- **Investment adviser**: As defined by the Investment Adviser Act of 1940 \(^{53}\), an investment adviser is anyone, individual or firm, that operates in the business of

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\(^{53}\) There is a digital current version of the law on the website of the SEC, which can be accessed through the following link: [https://www.sec.gov/about/laws/iaa40.pdf](https://www.sec.gov/about/laws/iaa40.pdf)
advising on financial securities, either stocks, bonds or mutual funds, among others, to its customers in return for a fixed or a variable fee.

Within the structure of a hedge fund, the investment adviser is usually the sponsor or general partner, although sometimes is a firm related to that partner. Among its duties, the investment adviser is responsible for launching the fund, for which it has to set up the different clauses and agreements applicable both to the sponsor and to the limited partners, as well as the agreements governing the relationship between the fund and its service providers; to create the most efficient organizational structure; to manage the day to day operations of the hedge fund; to handle relations with investors; to raise capital; to deal with some aspects relating to regulatory compliance; as well as to cope with all the reporting obligations required either by investors or by government agencies, among others.

- **Management Company**: As its name suggests, the management company is in charge of building and managing the portfolio of the hedge fund or, in other words, it is responsible for taking positions based on the recommendations made by the investment adviser to thereby achieve the objectives of the hedge fund.

Usually, the management company belongs to the sponsor, so the portfolio is constructed exactly as desired by the main portfolio manager but sometimes, in those cases where the funds are in early stages of life, the management company is a financial firm which provides this type of service in exchange for a certain commission or fee.

- **Prime brokers**: The prime brokers are an essential element for all hedge funds because, without them, it would be impossible to implement any desired strategy. Usually, prime brokers are large investment banks that provide such services but, sometimes, hedge funds employ specialized financial boutiques that are able to deliver high quality services with a lower cost.

Among all the different services provided by prime brokers to hedge funds there are financing, which refers to funds that such institutions lend to hedge funds so they can take leveraged positions; back office services, among which are settlement, delivery, order management system, compliance and accounting services, among others; securities custody, which allows the manager to have real time information of the fund’s positions, historical transactions and even of the returns of the portfolio both at the aggregate level and the performance attribution of the individual positions; securities lending, essential to implement all strategies that require short sales; risk management services, through which managers can be aware of the different risks that arise from the exposures of the portfolio; research and analysis services, such valuation of specific assets or securities in order to complement the work of the buy side research analysts employed by the fund; as well as capital introduction services, due to the huge

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network of contacts that large banks have, which is sometimes even used to distribute the hedge fund among its customers if has been agreed between parties. In addition, with all the above aspects, some prime brokers provide a wide range of proprietary technology solutions aimed to facilitate the communication between parties in the most convenient, efficient and least expensive possible way.

The top 5 prime brokers of hedge funds as of January 2015 are shown below.

### Table 3: Top 5 prime brokers of hedge funds as of January 2015

<table>
<thead>
<tr>
<th>Rank</th>
<th>Name</th>
<th>Market Share</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Goldman Sachs</td>
<td>20.617%</td>
<td>648</td>
</tr>
<tr>
<td>2</td>
<td>JP Morgan Chase Bank</td>
<td>13.745%</td>
<td>432</td>
</tr>
<tr>
<td>3</td>
<td>UBS</td>
<td>9.227%</td>
<td>290</td>
</tr>
<tr>
<td>4</td>
<td>Morgan Stanley</td>
<td>8.559%</td>
<td>269</td>
</tr>
<tr>
<td>5</td>
<td>Bank of America Merrill Lynch</td>
<td>7.031%</td>
<td>221</td>
</tr>
</tbody>
</table>

Source: Cogent's Service Provider League

- **Administrator**: The fund administrator is responsible for all the supporting and operating activities of the fund. Basically, it deals with all the operational activities needed in any hedge fund, with the exception of the fund’s investments, which are carried out by the management company.

Among the many activities performed by the fund administration are acting as a link between investors and managers; NAV calculation (value of the fund's assets after deducting liabilities); calculation of the returns of the fund; computation of several portfolio statistics, including those relating to risk; to deal with the payment of various expenses incurred by the fund; reporting of all the documentation required by law; calculation and payment of distributions if applicable; bookkeeping of orders; to draft and submit the quarterly and annual reports; to deal with aspects related to securities trading; collection and payment of dividends; compliance monitoring; as well as to provide basic advice on fiscal and legal matters, among others.

The top 5 administrators of hedge funds as of January 2015 are listed in the following table.

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Table 4: Top 5 administrators of hedge funds as of January 2015

<table>
<thead>
<tr>
<th>Rank</th>
<th>Name</th>
<th>Market Share</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Citi</td>
<td>9.066%</td>
<td>572</td>
</tr>
<tr>
<td>2</td>
<td>Royal Bank of Canada</td>
<td>7.847%</td>
<td>495</td>
</tr>
<tr>
<td>3</td>
<td>HSBC</td>
<td>6.674%</td>
<td>421</td>
</tr>
<tr>
<td>4</td>
<td>Citibank</td>
<td>6.198%</td>
<td>391</td>
</tr>
<tr>
<td>5</td>
<td>Northern Trust</td>
<td>3.997%</td>
<td>208</td>
</tr>
</tbody>
</table>

Source: Cogent's Service Provider League Tables

- **Trustee/Custodian**: As its name suggests, the custodian is responsible for holding the assets of the fund in electronic or physical form. Usually, the trustee is a large investment bank that provides such services as part of its prime brokerage package but, nevertheless, there are also independent firms specialized in securities custody services.

Its main task is to make sure that the positions taken by the manager are legally registered in the name of the fund or, in other words, the custodian is responsible for certifying the ownership of the assets of the hedge fund in favor of it. In addition, it is also in charge of the settlement when the fund sells and receives the purchased assets; keeping a record of all transactions made by the fund; as well as administering the cash accounts of the hedge fund.

The following table shows the top 5 custodians of hedge funds as of January 2015.

Table 5: Top 5 custodians of hedge funds as of January 2015

<table>
<thead>
<tr>
<th>Rank</th>
<th>Name</th>
<th>Market Share</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>JPMorgan Chase Bank</td>
<td>10.826%</td>
<td>506</td>
</tr>
<tr>
<td>2</td>
<td>Royal Bank of Canada</td>
<td>10.762%</td>
<td>503</td>
</tr>
<tr>
<td>3</td>
<td>HSBC</td>
<td>9.478%</td>
<td>443</td>
</tr>
<tr>
<td>4</td>
<td>Citibank</td>
<td>7.107%</td>
<td>335</td>
</tr>
<tr>
<td>5</td>
<td>RNP Panas</td>
<td>6.932%</td>
<td>324</td>
</tr>
</tbody>
</table>

Source: Cogent's Service Provider League Tables

- **Legal adviser**: The legal adviser is responsible for providing tax and legal advisory services, as well as for advising on issues relating to compliance required by law, either nationally or internationally. Among these services are defining all the clauses governing the fund; subscription and amortization agreements; and ultimately, dealing with the draft of any necessary documentation. Usually, the legal advisor of a hedge fund is an international and worldwide renowned law services firm but, sometimes, some funds hire firms that specialize in particular legal issues.
The top 5 legal advisers of hedge funds as of January 2015 are the following ones.

**Table 6: Top 5 legal advisers of hedge funds as of January 2015**

<table>
<thead>
<tr>
<th>Rank</th>
<th>Name</th>
<th>Market Share</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PricewaterhouseCoopers</td>
<td>26.814%</td>
<td>1792</td>
</tr>
<tr>
<td>2</td>
<td>KPMG</td>
<td>22.400%</td>
<td>1497</td>
</tr>
<tr>
<td>3</td>
<td>Ernst &amp; Young</td>
<td>19.228%</td>
<td>1285</td>
</tr>
<tr>
<td>4</td>
<td>Deloitte</td>
<td>11.163%</td>
<td>746</td>
</tr>
<tr>
<td>5</td>
<td>McGladrey LLP</td>
<td>4.085%</td>
<td>273</td>
</tr>
</tbody>
</table>

Source: Cogent's Service Provider League Tables

- **Auditor**: Hedge funds also have an independent auditor to deal with the mandatory audit process aimed to verify the accounts of the fund, thereby trying to prevent fraud and deception to investors. In order to avoid possible problems due to lack of experience, funds often hire a major and internationally renowned audit firm to determine the actual value of the fund's assets, as well as the value of the individual positions of each one of the investors at the end of the period.

The top 5 auditors of hedge funds as of January 2015 are listed below.

**Table 7: Top 5 auditors of hedge funds as of January 2015**

<table>
<thead>
<tr>
<th>Rank</th>
<th>Name</th>
<th>Market Share</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PricewaterhouseCoopers</td>
<td>26.814%</td>
<td>1792</td>
</tr>
<tr>
<td>2</td>
<td>KPMG</td>
<td>22.400%</td>
<td>1497</td>
</tr>
<tr>
<td>3</td>
<td>Ernst &amp; Young</td>
<td>19.228%</td>
<td>1285</td>
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<td>746</td>
</tr>
<tr>
<td>5</td>
<td>McGladrey LLP</td>
<td>4.085%</td>
<td>273</td>
</tr>
</tbody>
</table>

Source: Cogent's Service Provider League Tables

- **Registrar and transfer agent**: As its name suggests, the registrar is responsible for keeping a detailed and updated register of all of the investors of the fund; processing desired redemptions or subscriptions; as well as for calculating and distributing any distributions to investors. Usually, this is one of the services provided by many administrators of hedge funds that exist in the world, although there are some prestigious firms specialized exclusively in this task that provide superior quality services with a lower cost.

- **Listing sponsor**: The listing sponsor refers to all those firms providing services aimed to help hedge funds to become part of a particular index. In other words,
it is a firm that ensures that the fund shares are listed and traded on a particular stock market index.

Among the tasks performed by these firms are to evaluate the suitability of the fund before being admitted to trading; to assist in the preparation of the prospectus that will be distributed to investors; to coordinate the due diligence process of the hedge fund with both legal advisers and auditors in order to make sure that the information contained in the prospectus is as accurate and clear as possible; as well as to advise on all the requirements that the fund needs to cope for the simple reason of being listed on a particular index, among others.

The top 5 listing sponsors of hedge funds as of January 2015 are shown below.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Name</th>
<th>Market share</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>J&amp;E Davy</td>
<td>35,419%</td>
<td>334</td>
</tr>
<tr>
<td>2</td>
<td>NCB Stockbrokers Limited</td>
<td>12,723%</td>
<td>120</td>
</tr>
<tr>
<td>3</td>
<td>McCaffrey LLP</td>
<td>11,435%</td>
<td>108</td>
</tr>
<tr>
<td>4</td>
<td>Goodbody Stockbrokers</td>
<td>10,817%</td>
<td>102</td>
</tr>
<tr>
<td>5</td>
<td>Dillon Eastace</td>
<td>4,984%</td>
<td>41</td>
</tr>
</tbody>
</table>

Source: Cogent's Service Provider League Tables

- **External distributors**: Typically, major hedge funds that exist in the world, due to the high volume of assets managed, have their own sales force aimed to deal with the distribution of the different funds available to potential investors, either through technological platforms provided by prime brokers, cold calling, events for investors or by using any other method.

However, those funds that still have a low volume of assets under management to sustain an own sales force, may choose to hire firms that specialize in the distribution of funds among institutional investors and high net worth individuals. In fact, it is quite common for this type of distribution firms to represent not one, but several hedge funds that generally do not compete with each other, basically because they implement different strategies or are targeted to investors based in different regions.

2.3.3 Alternative structures

In certain cases, hedge funds have tailored structures\(^{56}\) in order to meet the needs of some investors, as there are individuals from around the world that demand certain special characteristics that are not usually present in the traditionally used structures of this type of investment vehicles.

\(^{56}\) Lhabitant, F.: **Handbook of Hedge Funds**, Wiley, 2006
• **Master/feeder structure**: One of the most common structures used by certain hedge funds is the master/feeder structure, which is shown below.

![Figure 6: Master/Feeder Structure](image)

Source: Compiled by author based on information from Citibank.com

This way of structuring investment funds consists basically in a master fund in which several subordinate funds make their investments. In other words, a given asset manager creates various feeder funds targeted each of them specifically to a group of investors, so that there will be several funds according to the various jurisdictions in which the asset manager is interested in raising capital. Then, the investors will make their investments in these subordinated funds. Feeder funds invest their funds in the master fund, which will be managed by the asset manager who has launched the structure.

In this structure, the master fund will be responsible for carrying out the investments in order to build the portfolio, while both management fees, as well as success or performance fees, will be charged to the feeder funds. Obviously, gains and losses achieved by the master fund will be allocated proportionally to each one of the feeder funds that invest on it depending on the volume of the investments made.

Among the main advantages of this structure are the great flexibility of each one of the feeder funds when fixing issues such as fees, structure, objectives and distribution of the fund, among others; the possibility to adapt each feeder fund to the conditions required by the regulator of a particular jurisdiction; the great opportunities that has the structure in order to raise capital from investors based in different jurisdictions, thus increasing assets under management of the fund and, therefore, its revenue; the important cost reduction due to the centralization of all the activities related to the management of the master fund and due to higher volume of assets under management that creates economies of scale in
the operations of the fund; as well as the increased efficiency of the fund in several tax aspects as a result of the structure, among many others.

Moreover, within the main disadvantages there are aspects such as the fact that certain investors, particularly those investing in feeder funds registered in jurisdictions where there is a favorable tax regime, have obvious advantages if they decide to amortize their holdings in comparison to those investors who have invested through feeder funds registered in those countries where the tax legislation is less permissive; the additional costs of maintaining both a master fund and many feeder funds, which could be a major impediment to hedge funds that have a relatively small volume of assets under management; and the different investment objectives, tax planning aspects as well as risk tolerance levels of all those investors from different jurisdictions that may led to a situation where some strategies may be suitable for some investors but, however, may not be the most correct for others, and even due to the fact that some investors may not have exactly the same investment objectives in terms of both profitability and taxation. In addition, another important disadvantage are the several problems that may arise when valuing the assets of each of the feeder funds, as this task is carried by the master fund but, however, the administrators of the subordinated funds do not have access to the data used by the master fund unless the fund has decided to provide that information.

- **Clone funds:** This type of structure consists of the creation, in different jurisdictions, of several separate and unrelated funds but that, nevertheless, share similar investment objectives, strategies, managers, as well as service providers required to perform the operations of each fund. In this regard, all the funds possess an almost identical portfolio although, as a result of various aspects such as potential opportunities and even taxation, may be differences in the returns achieved by each of the funds. Usually, the main problem of this type of structure is that all the funds need to maintain a portfolio that is virtually identical, so all the subscriptions and redemptions that may have one of the funds require managers to re balance the portfolios of the other funds in order to keep their positions almost identical.

An example of a typical structure of clone funds is shown below.

![Figure 7: Clone Funds](source: Compiled by author based on Lhabitant, F.: Handbook of Hedge Funds, Wiley, 2006)
The main advantages provided by this structure are to enable certain investors based in regions where taxation is attractive to invest in strategies carried out by investment advisers based in countries with less attractive tax regimes, all without any obligation to these investors to cope with existing regulations in the country in which the investment adviser is registered; as well as the relatively few conflicts of interest, because investors are able to invest in the fund that best suits their interests.57

On the other hand, the main disadvantage of this type of structure is the fact that, due to the fact that the various investments are not aggregated, like in a master/feeder structure, it is virtually impossible to achieve economies of scale and therefore the costs are higher. This disadvantage, often do not pose any problem for those hedge funds that have a high volume of assets under management but, however, it can be a major impediment for all those hedge funds managing a relatively small volume of assets.

- **Umbrella structure**: Another structure used by some hedge funds is the so-called umbrella structure, which consists of creating a separate legal entity, as well as several separate funds which are considered as individual investment funds. These funds generally hold various investment strategies, and are managed by teams of managers and analysts that are completely independent of the ones in charge of managing the other funds of the structure. Moreover, it is quite common to find different types of shares on each of the separate funds to fit them to the needs of the different investors.

The following figure shows a typical example of an umbrella structure.

**Figure 8: Umbrella Structure**

![Umbrella Structure Diagram](image)

Source: Compiled by author based on Lhabitant, F.: Handbook of Hedge Funds, Wiley, 2006

Among the advantages of this structure are the possibility for investors to decide in which fund they want to invest based on the strategy, investment objectives,

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risks, or even the management team, among other variables; greater efficiency, particularly related to tax aspects, because it usually allows some investors to defer their tax liabilities; the ability of some investors to transfer their funds between the different strategies of the structure without generating a taxable capital gain with relatively low costs; the fact that the assets and liabilities of each fund are independent of those other funds of the structure, so that if a strategy have losses, these losses are not transferred to the other strategies of the structure; as well as the greater flexibility offered to investors, as they can invest in very different strategies, which increases the number of potential individuals willing to invest in the structure and, consequently, the possibility of increasing assets under management and generating more profits, among other things.

On the other hand, within the main disadvantages of this type of structure are the fact that, in certain jurisdictions, investors of the different funds of the structure must face losses in the event that problems may arise in one of the funds, as well as the fact that it exhibit relatively high costs compared to other structures because it needs several investment teams in order to implement each strategy, among others.

- **Managed accounts**: This structure consists of an account opened by any individual investor that is the owner of all the assets of the account, which is managed professionally and independently by a dedicated manager. An example of a managed account is shown below.

![Figure 9: Managed Account](source: Compiled by author based on L’habitant, F.: Handbook of Hedge Funds, Wiley, 2006)
Typically, these services are offered exclusively to clients who have accounts with a certain volume that normally tends to be very high. This makes that the vast majority of the accounts managed by certain hedge funds are owned by institutional investors or individuals with a high net worth.

In this structure, the account is managed according to a defined and customized manner based on the specific wishes of the investor contained in the investment mandate. In addition, the investor has at all times the full capacity to decide whether or not to carry out certain investments, regardless of what the manager decides.

In operational terms, a particular client that has a securities account at a financial institution hires a hedge fund that will be in charge to manage the account or, in other words, the hedge fund is in charge of taking different positions on behalf of the client.

Among the various advantages of managed accounts are the professional management, because it is the investor the one who define the objectives but it is a professional portfolio manager the one who is in charge of taking positions to achieve those objectives; high transparency because, as the investor is the one that own the assets, he/she have access at any time to the status of the account; flexibility to the investor, as he is the one who is responsible to decide how the account will be managed, and has the ability to remove the mandate to the hedge fund at any time; high liquidity, as the investor may decide to undo all or part of the positions at all time it deems appropriate; as well as the generally greater investor protection because he/she has full control over his/her funds, among others.

On the other hand, the main disadvantages are the higher costs that often are assumed by investors, particularly when it comes to hiring the best managers; the high volume of asset requirements requested by hedge funds when managing an individual account of an investor, making it very difficult for the vast majority of investors to gain access to these services; as well as, usually, the limited access that has the investor to specific metrics used by the hedge fund when managing the account, being especially relevant those relating to the risks taken or to the valuation of the several positions of the portfolio, among others.

- **Side pockets**: A side pocket refers to a type of account set up by a hedge fund whose primary objective is to separate the liquid assets of the illiquid ones. In this regard, it is noteworthy that the investments in this type of structure are usually restricted to those investors that are clients of the hedge fund, so once it is created, it will not accept new investments of external investors though, however, if a particular client decided to invest in one of these accounts and then the client decides to leave the hedge fund, that client will still have the right to receive his share of the profits achieved by the strategy.
The main positive aspect of this structure for those who decide to invest in it is the fact that, as a consequence of the illiquidity of the assets in which the strategy invests, the return possibilities are quite high. On the other hand, the main problem is the fact that the risks are high, as well as that not all investors are able to access to it because it is usually restricted to clients of the hedge fund.

- **Multi share funds**: Some hedge funds that have a single portfolio comprised of the different investments made by the fund choose to create different types of shares aimed at investors with different characteristics. Usually, this type of structure allows the fund to charge different rates and even to apply different clauses to each of the existing share classes, as well as to raise additional capital through the creation of a new share class in certain funds and jurisdictions, among other aspects.

- **Segregated portfolio company (SPC)**: This type of structure consists of the creation of a separate legal entity to subsequently segregate the assets and liabilities of various portfolios of investors between different cells or separated funds, which in turn are independent legal entities. This is important because, due to the fact that each cell is independent of the other cells, in the event that problems may arise in one of the cells, the investors of the other cells will not face any additional obligation, so the structure will minimize the risks of investors, thus ending with one of the main disadvantages of the umbrella structures.

- **Custom structures**: Some hedge funds that require of a custom structure with special features, designed for a particular purpose, may opt for a customized structure that satisfies the interests of investors. In these cases, the possibilities are endless, so the structure will be one or another depending on the required characteristics and the needs of the investors.

Usually, a custom structure involves the creation of a Special Purpose Vehicle (SPV) that buys the hedge fund units or that becomes a limited partner of the fund. Then, the SPV issues a structured product that is bought by investors. The following figure shows an example of a custom structure with a SPV.

**Figure 10: SPV**

![Figure 10: SPV](source: Lhabitant, F.: Handbook of Hedge Funds, Wiley, 2006)
2.4 REGULATION

Usually, and due to the fact that the investor base of hedge funds consists of institutional investors and ultra-net worth individuals with enough capacity and power to be able to face losses due to bad investments, the legislation has not been as strict with the hedge fund industry compared with other industries in which operate financial institutions such as banks, insurers and traditional asset managers. However, and regardless of that hedge funds are considered by many individuals as investment vehicles aimed for pure speculation, the industry has not been the one most criticized after the recent crises occurred, but have been other financial institutions, all considered as traditional, such as banks or insurance companies, the ones more affected by critics in the last years

In recent decades and, due to different crises, the financial industry has come to be heavily regulated to try to avoid, as far as possible, similar critical situations in which a large number of people from around the world have been affected greatly with job cuts, income reduction and a great loss of standard of living. To this end, the existing legislation has placed special emphasis, on the one hand, in monitoring a large number of entities considered as systemic, which have to face minimum liquidity requirements, minimum capital, special risk management procedures, as well as transparency and compliance requirements in order to ensure the sustainability and future stability of the entity and, on the other hand, in protecting the interests of customers to avoid scams, frauds or unethical behaviors in the industry that may damage the reputation and confidence of investors in a large number of financial institutions operating in specific countries or markets.

Moreover, hedge funds have always been considered, as discussed previously, as loosely regulated investment vehicles due to the complex legal structure that they usually present. This aspect makes perfect sense, since a large number of hedge funds in the world operate in tax havens with the simple aim of increasing efficiency and flexibility, thereby achieving competitive advantages over traditional asset managers that enable them to achieve sustained superior returns over time.

Also, and given the large number of service providers that hedge funds require in order to carry out with their daily operations and to implement the various strategies desired, it cannot be said that the hedge fund industry is not regulated to some extent, at least indirectly, because usually such service providers are large international investment banks considered by regulatory authorities of all over the world as systemic entities that, as seen above, are heavily regulated, even more strictly since the beginning of the global financial crisis that started in 2007 which, still today, continues to adversely affect a large number of economies around the world.

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58 Davies, H.: The Financial Crisis - Who is to blame?, Polity, 2010
However, and due to the increasing size that has been reaching in the hedge fund industry in recent years to the current level of 2.82 trillion dollars, concerns by a large number of regulators have increased, among other things due to the increasingly high number of not only professional investors, but also wealthy individuals, who have decided to invest in hedge funds in the last years in order to further diversify their portfolios, motivated in large part by reductions in the minimum investment requirements of certain funds, as well as because of the larger audience that hedge funds have reached recently because of the introduction of the JOBS Act that allowed them to advertise in traditional media such as TV, radio or newspapers, with the aim of getting known by the general public 59.

Regarding the objectives set by the vast majority of international regulatory authorities considered when establishing the rules designed to effectively regulate the hedge fund industry and, regardless of the normal differences between countries and regions, all the regulation affecting the traditional financial industry do not show big differences, as will be seen, since the main objectives are to achieve a more effective supervision of the industry; to increase transparency; to avoid collapses of large institutions that may jeopardize the stability of the economy and, ultimately, to protect the interests of investors.

2.4.1 Regulation in the United States

To understand how the hedge funds industry is regulated in some of the most important economies of the world, seems as essential to first analyze the laws regulating the industry in the United States. This is important because, as noted before, the vast majority of assets under management of the hedge fund industry are still managed in the North American country 60.

Before starting the enumeration of the most important laws affecting the hedge fund industry in the US, it must be noted that this section includes only a brief summary of the main aspects of each of the laws analyzed, as the main purpose of this thesis is not related to a deep analysis of the regulation concerning the hedge fund industry globally. However, for all those interested in knowing in detail other important aspects of the different laws included in this section, the Appendix III includes a deep analysis of all the laws.

Today, the supervision of all the activities of financial institutions operating within the borders of the United States and providing services to the general public lies in both the

59 In this regard, it must be noted that Toturn Capital became the first hedge fund to advertise. The ad can be watched at the following link: http://www.topturncapital.com/
60 Lhabitant, F.: Handbook of Hedge Funds, Wiley, 2006
"Securities and Exchange Commission" (SEC)\(^{61}\), which is primarily aimed to interpret and enforce the laws governing US securities markets; to issue new laws and amend the former ones; to supervise all firms operating in the securities markets, including private self-regulatory corporations\(^{62}\); and to coordinate all applicable securities markets regulation with the various levels of federal, state, local and even foreign regulatory authorities; and the "Commodity Futures Trading Commission" (CFTC)\(^{63}\), responsible for protecting all individuals who participate in the US futures markets, either investors or firms who serve in these markets, of possible frauds, market manipulation, abusive practices or systemic risks, among others, with the aim of increasing the transparency and efficiency of these markets.

Along with the two aforementioned agencies, there is a third one that, although it is not in charge of overseeing the hedge fund industry, may have a great impact on it because of its decisions, either positive or negative, depending on how those decisions and actions affect the portfolio holdings of certain hedge funds. This is none other than the central banking system of the US\(^{64}\), known as the "Federal Reserve System" (or colloquially as the FED), which is in charge of defining and implementing the monetary policy in the country. In this regard, the implementation of the monetary policy and, in contrast with the European Central Bank that has the sole mandate of achieving price stability, the Federal Reserve System has a much broader mandate, as it aims not only to achieve price stability, but also full employment, moderate long term interest rates, as well as to maintain the stability of the financial system by containing potential systemic risks that may arise, among others. All these aspects can explain why hedge funds are constantly monitoring the perspectives, outlook and possible actions that the FED may take, with the aim of trying to anticipate or at least be prepared for any action, expected or not, in order to take advantage of it and achieve higher returns.

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\(^{61}\) If you want more information about several SEC aspects like its history, objectives, organization or educational resources, among others, it is recommended to visit its own website through the following link:
http://www.sec.gov/

\(^{62}\) Among these private organizations that oversee the financial industry stands out above the others the "Financial Industry Regulatory Authority" (FINRA), formerly known as the "National Association of Securities Dealers" (NASD). However, and regardless of the existence of certain independent private organizations responsible of overseeing market members and financial markets, all of them are supervised by the SEC, as it is the ultimate regulatory authority of the securities industry in the United States.

\(^{63}\) More information on the CFTC on its own web site:
http://www.cftc.gov/index.htm

\(^{64}\) The FED is referred as the central banking system of the US because it is composed of the Federal Reserve Board, the Federal Open Market Committee, 12 regional Federal Reserve Banks, as well as of several privately owned US banks and even some advisory councils. If you want to access to detailed information about the objectives, structure, educational resources and even information on monetary policy, among other things, it is recommended to visit the FED’s web site at the following link:
http://www.federalreserve.gov/
2.4.1.1 Securities Act of 1933

The first of the laws affecting the operations of hedge funds in the United States is none other than the Securities Act of 1933\textsuperscript{65}. The two basic objectives of the Act are shown in the following table.

<table>
<thead>
<tr>
<th>Securities Act of 1933</th>
<th>Main Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>To require that investors receive financial and other significant information concerning securities being offered for public sale</td>
<td>To prohibit deceit, misrepresentations, and other fraud in the sale of securities</td>
</tr>
</tbody>
</table>

In addition, the Act also had other objectives. Among the most important objectives outlined in the Act, are the obligation to register some securities offered publicly with the SEC with the aim that the information contained in the registry of the Commission could be accessed at all times required by those who wish to, helping such investors to make investment decisions based on information that is as close to reality as possible.

With regard to the registration process of securities, it must be said that it is complex and costly, given the large amount of information that usually needs to be registered by all those firms that issue securities that may be purchased by the general public. However, there are certain securities that do not have any obligation to register because they are exempted by the Act, provided that certain special aspects are met. These exemptions are included in the following table.

<table>
<thead>
<tr>
<th>Securities Act of 1933</th>
<th>Offerings exempted from registration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private offerings to a limited number of persons or institutions</td>
<td>Offerings of limited size</td>
</tr>
</tbody>
</table>

\textsuperscript{65} Also known in the United States as the “Truth in Securities Act”. An online version of the Act is available online at the following link: \texttt{http://www.sec.gov/about/laws/sa33.pdf}
Also, the Act requires that a complete brochure containing the main features and risks of the offering must be distributed among investors. This process, is not only laborious, but also has some pretty high costs. In this regard, it must be noted that hedge funds try to avoid at all costs the expensive registration process by structuring their offerings as private offerings, as these offerings are exempted from such registration if they comply with certain prerequisites included in the "Regulation D". The following table summarizes these requirements.

![Table 11: Regulation D Requirements of private offerings to be exempted from registration](source: Compiled by author based on information from invigorlaw.com)

Along with the analyzed above "Regulation D", hedge funds often use another important law that include certain exemptions from registration of private placements that, in this case, are carried out among investors who are based outside the US borders. This law is none other than the "Regulation S", which applies to offerings that took place outside the United States of both domestic and foreign issuers, and which dictates that some of these offerings, if they are conducted abroad and if the issuer or any of its affiliates does not conduct any direct sales effort in the US, are not required to register with the SEC.

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66 You can access to the latest version of Regulation D for free through the website of the "Electronic Code of Federal Regulations", controlled by the Government of the United States, at the following link: [http://www.ecfr.gov/cgi-bin/text-idx?SID=465dc4251925603a672a767b7916fc49&node=sg17.3.230_1498.sg11&rgn=div7](http://www.ecfr.gov/cgi-bin/text-idx?SID=465dc4251925603a672a767b7916fc49&node=sg17.3.230_1498.sg11&rgn=div7)

67 You can access to an online version of the "Regulation S" through the website of the SEC at the following link: [http://www.sec.gov/rules/final/33-7505.htm](http://www.sec.gov/rules/final/33-7505.htm)
2.4.1.2 Securities Exchange Act of 1934

The second of the major laws affecting the operations carried out by hedge funds in the United States is the Securities Exchange Act of 1934. In this law, the Congress of the United States created the SEC in order to monitor and oversee the markets and the firms that are in any business related to financial markets within the country. The firms regulated and supervised by the SEC are shown in the following table.

<table>
<thead>
<tr>
<th>Firms regulated and supervised by the SEC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brokerage firms</td>
</tr>
<tr>
<td>Transfer agents</td>
</tr>
<tr>
<td>Clearing agencies</td>
</tr>
</tbody>
</table>
| Self regulatory organizations
  (securities exchanges, FINRA)            |

Source: Compiled by author based on Securities Exchange Act of 1934

In addition, the law gives the SEC authority over all aspects relating to the industry of national securities that, at that time, began to become the largest in the world in terms of importance, as well as in terms of volume. Also, the law also identifies and prohibits certain unethical and harmful behaviors that may jeopardize the relationship of trust and cordiality between investors and firms operating in the securities markets.

One of the key aspects included in the Securities Exchange Act of 1934 is to force all companies with more than $10 million of equity, and whose shares are held by a certain minimum number of investors, namely 500 participants, to submit certain reports periodically to the general public, as well as any relevant corporate information about the company, that can be accessed through the EDGAR database made available by the SEC. As discussed previously, the most important reports are the quarterly and annual reports, in which the financial position of the company is reflected at the end of a given period, and that must be written and audited by an independent auditor.

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68 You can access to the online version of this law through the website of the SEC at the following link: https://www.sec.gov/about/laws/sea34.pdf

69 The SEC defines a maximum number of participants (500) of a hedge fund in order to be exempted from registration, if some other features required by law are met. This is quite common in a number of funds that are in early stages of their life, but not in the major existing hedge funds globally due to the high volume of assets under management and investors that have the vast majority of all of them, well above the minimum threshold.
Moreover, some hedge funds are required to register with the SEC as dealers, defined as any person whose usual business activity is related to securities trading on its own, as well as in others name, something that has been historically differentiated of what the Commission means by trader, referring to those individuals who buy and sell securities, but not as part of their normal business. This distinction is particularly relevant among other things because, usually, traders do not have to register with the SEC, so many hedge funds take advantage of it in order to save the laborious and costly registration process.

The last important aspect to consider is the fact that those hedge funds that manage a volume of over 100 million, as well as banks, insurers or traditional asset managers, are obliged to submit on a quarterly basis the long positions maintained in their portfolio on the appropriate Form 13F. This form must be completed within 45 days of the end of the quarter and, in many cases, is used by a large number of investors from around the world when making investment decisions based largely on the long positions reported by the major funds in the world.

### 2.4.1.3 Trust Indenture Act of 1939

Another law affecting the activities carried out by certain hedge funds is the Trust Indenture Act 1939\(^{70}\). This law, which active to fixed income securities, such as bonds, notes or letters, among others, was created to protect all investors of bonds for those cases in which a particular entity is unable to face its contractual obligations. To do this, the law requires the appointment of a trustee who will have the power to confiscate the assets of the company which carried out the bond issue and to sell them to recover, if not all, at least part of the investments made by bondholders and thereby protect their rights and interests. Also and, whether such securities are registered with the SEC or not, a bond issue with a volume of more than $5 million cannot be offered to the general public without a written agreement in which both parties, the company and the bondholder, have given their consent by signature, and in which the main characteristics of the issue are detailed.

### 2.4.1.4 Investment Company Act of 1940

The Investment Company Act of 1940\(^{71}\) is one of the most important laws to consider when analyzing the existing US legislation aimed at regulating the activities of hedge funds. In this regard, this law regulates all those companies that are considered investment companies, which are defined as those whose principal and recurrent activity is related to investments, reinvestments and securities trading, and whose securities are publicly offered to a large number of investors. Therefore, the law regulates and defines

\(^{70}\) You can access to an online version of the law on the website of the SEC at the following link: [https://www.sec.gov/about/laws/tia39.pdf](https://www.sec.gov/about/laws/tia39.pdf)

\(^{71}\) An online version of the law is available on the website of the SEC at the following link: [https://www.sec.gov/about/laws/ica40.pdf](https://www.sec.gov/about/laws/ica40.pdf)
the responsibilities, roles and limitations of companies such as asset managers, mutual funds, hedge funds, private equity funds and even holding companies, among others, that offer investment products to the public.

In general terms, the law seeks to end, or at least to greatly minimize, with potential conflicts of interest that may arise in certain transactions given their complexity and, ultimately, to promote funds to act always in the best way for their investors’ interests.

In addition, it must be noted also that there are certain situations that allow an issuer to be exempted from registration with the SEC. The first of these conditions that allow an issuer not to register with the SEC requires that the issuer's shares must be held by a maximum of 100 investors based in the United States, and provided that the issuer has not carried out a publicly placement. In addition, the Act allows certain funds of being exempt from SEC registration if the shares of the fund are exclusively held by the so-called qualified buyers, also known as super-accredited investors.

2.4.1.5 Investment Advisers Act of 1940

Another major piece of existing legislation currently affecting operations carried out by hedge funds in the United States is the Investment Advisers Act of 194072. This law has a very similar structure of the one discussed above, but in this case it is aimed at regulating the responsibilities and the role of investment advisers.

In general terms, with very few exceptions, the law stipulates that all companies, or individuals, who obtain any compensation for investment advice should register with the SEC and comply with all the obligations in order to protect the interests of investors.

Moreover, and as usual, there are certain exemptions that may be used by some hedge funds, if certain conditions are met, that allow some investment advisers not to register with the SEC. Some of these exemptions are that the investment adviser must have no more than 15 clients; that the adviser do not provide any financial advisory services to any investment services company that have the obligation to be registered with the SEC; and that does not advertise itself to the public as an investment adviser. Furthermore, and along with the above, any investment advisor that manages a volume of assets of less than $25 million do not have the obligation to register with the SEC.

72 An updated digital version of the law can be found on the SEC website at the following link: https://www.sec.gov/about/laws/iaa40.pdf
2.4.1.6 Commodity Exchange Act of 1974

As mentioned before, all the activities of hedge funds operating in the United States are usually supervised by the SEC, as well as by the "Commodity Futures Trading Commission CFTC", in those situations where the strategies implemented by some hedge funds involve the use of financial futures contracts on commodities. In this regard, all those hedge fund managers operating with commodity futures are defined as "Commodity Pool Operators CPO", while anyone who advise on these products will be defined as a "Commodity Trading Adviser CTA". This aspect is relevant, because the Commodity Exchange Act of 1974\(^73\) requires that both CPO and CTA have to register with the CFTC, something that is time consuming as well as expensive. Furthermore, and along with the registration, the law requires compliance with certain aspects such as carrying out ethical practices, to report the operations performed in a clear and precise manner, as well as to keep a record of all activities carried out, among others.

The main differences between a CTA and a CPO are shown in the following chart.

Table 13: Main differences between a CTA and a CPO

<table>
<thead>
<tr>
<th>COMMODITY TRADING ADVISOR (CTA)</th>
<th>COMMODITY POOL OPERATOR (CPO)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTAs are responsible for advising managed accounts and pooled investment vehicles, such as commodity pools.</td>
<td>CPOs are the organizations managing the commodity pools.</td>
</tr>
<tr>
<td>CTAs regularly advise investors about the value of commodity futures or options or the advisability of trading in commodity futures or options.</td>
<td>A CPO solicits or accepts funds, securities, or property from prospective investors in the commodity pool.</td>
</tr>
<tr>
<td>A commodity pool describes an investment vehicle in which money contributed by a number of persons, investors or entities is combined for the purpose of trading futures, swaps, contracts or commodity options with limited liability.</td>
<td>CPOs can make trading decisions on behalf of the pool, or they can retain the services of a CTA to do so.</td>
</tr>
<tr>
<td>A formal definition of a CTA is provided under the Commodity Exchange Act (CEA) (P.L. 74-765).</td>
<td>Investments in commodity pools serve to diversify portfolios, helping to enhance portfolio returns and reduce volatility of investors.</td>
</tr>
<tr>
<td>Public commodity pools provide retail investors with access to products that were generally available to large investors.</td>
<td>CPOs are formally defined under Section 1a(5) of the CEA.</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on information from the Managed Funds Association (MFA).

\(^{73}\) You can access to a digital version of the law, in which the amendments carried out in recent years are included, through the website of the CFTC at the following link: http://www.cftc.gov/files/ogc/comex060601.pdf
However, and as in the case of the previously analyzed laws, some CPO or CTA will be exempted of registration with the CFTC if they met certain conditions, among which are having less than 15 investors or assets under management up to $200,000; that only family members of the manager can access to the fund; and that the portfolio manager does not receive any compensation for managing the assets, provided that he/she is not required to register due to other activities carried out, among others.

2.4.1.7 National Securities Markets Improvement Act of 1996

Introduced under President Bill Clinton, the National Securities Markets Improvement Act of 1996\textsuperscript{74}, also known as NSMIA, had as main objectives to make US securities markets more efficient; to improve and promote capital formation throughout the nation; to promote and boost greater efficiency in the business of managing investment funds, thereby protecting the interests of investors in a more precise way; as well as to make the existing regulation more efficient at both the state level and at the federal level. This last aspect, was achieved with the introduction of various laws at the federal level aimed to eliminate rules and regulations imposed by each state individually, helping thus achieving greater efficiency.

2.4.1.8 Sarbanes-Oxley Act of 2002

Launched in 2002 by the government of George Bush, the Sarbanes-Oxley Act is considered as one of the most important regulations of the financial industry introduced after several scandals that affected certain firms in the US\textsuperscript{75}.

The main objectives of the Act are included in the following table.

<table>
<thead>
<tr>
<th>Table 14: Main objectives of the Sarbanes-Oxley Act</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sarbanes-Oxley Act of 2002</strong></td>
</tr>
<tr>
<td><strong>Main objectives</strong></td>
</tr>
<tr>
<td>To enhance corporate responsibility</td>
</tr>
<tr>
<td>To enhance financial disclosures</td>
</tr>
<tr>
<td>To combat corporate and accounting fraud</td>
</tr>
<tr>
<td>Creation of the Public Company Accounting Oversight Board (PCAOB) to oversee the activities of auditors.</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on Sarbanes-Oxley Act of 2002

\textsuperscript{74} Available online at: \url{http://www.gpo.gov/fdsys/pkg/PLAW-104publ290/pdf/PLAW-104publ290.pdf}

\textsuperscript{75} Among the companies involved in these scandals were Enron, Tyco and WorldCom, among others. The most notorious one was the Enron scandal that ended with the demise of company, since it was discovered that its executives were reporting strong profits that came from businesses conducted with subsidiaries of the company in order to hide the huge losses that had the firm years before.
The main purpose of the Act was to protect the interests of investors in all cases of accounting frauds carried out by companies, for which various mechanisms and procedures were established as mandatory in order to improve the way in which companies reported any relevant financial information and, thus, to prevent and to avoid, to some extent, the falsification of financial statements by companies as well as accounting frauds. Among the various aspects covered by the law are issues such as transparency, responsibilities of top management teams of companies, ethical behavior, as well as aspects related to some limitations applicable to independent auditors.

2.4.1.9 Dodd-Frank Act of 2010

The international financial crisis that began in 2007 brought a huge battery of measures that were introduced by the Obama administration in order to prevent and minimize, as far as possible, the chances that a similar situation will happen again in the next few years. Among these measures, was the so called Wall Street Reform and Consumer Protection Dodd-Frank Act introduced in 2010.

This Act\textsuperscript{76}, introduces a great number of provisions\textsuperscript{77} that are expected to be implemented over the coming years and whose main objective is to reduce certain risks of the US financial system. Also, it created several government agencies designed to monitor and oversee some of the aspects included in the law, which will be analyzed in detail below. The following table shows the different government agencies created by the Dodd-Frank Act.

Table 15: Dodd-Frank Act Agencies created

<table>
<thead>
<tr>
<th>Agency Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Stability Oversight Council (FSOC)</td>
</tr>
<tr>
<td>Orderly Liquidation Authority (OLA)</td>
</tr>
<tr>
<td>Orderly Liquidation Fund (OLF)</td>
</tr>
<tr>
<td>Federal Insurance Office (FIO)</td>
</tr>
<tr>
<td>Consumer Financial Protection Bureau (CFPB)</td>
</tr>
<tr>
<td>Office of Credit Ratings (OCR)</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on Dodd-Frank Act of 2010

\textsuperscript{76} You can access to a digital version of this large and complex law in the SEC's website at the following link: \url{https://www.sec.gov/about/laws/wallstreetreform-cpa.pdf}

\textsuperscript{77} For an exhaustive list of the various provisions that, so far, have been introduced, as well as information on the actions being carried out in order to introduce the remaining provisions contained in the law, it is recommended to visit the SEC’s website at the following link: \url{http://www.sec.gov/spotlight/dodd-frank.shtml}
The Financial Stability Oversight Council (FSOC)\textsuperscript{78} and the Orderly Liquidation Authority (OLA), are designed to monitor, supervise and oversee all those companies that pose a systemic risk, in order to prevent the collapse of one of them that could jeopardize the financial stability and that may endanger the US economy. Also, the Council also has authority to divide those banks which, due to their size, are large enough to cause a collapse of the economy, as well as to restructure and liquidate any other company with financial problems, whether it pose systemic risk or not. In addition, the monitoring and controlling of all those companies of the insurance sector that can pose any systemic risk is conducted by the Federal Insurance Office.

On the other hand, the Consumer Financial Protection Bureau (CFPB)\textsuperscript{79}, is aimed, among other things, to prevent the so called predatory mortgage loans, which were considered as another of the main factors that led to the collapse of the world economy in 2007. In addition, it is also aimed to prevent banks, and even certain intermediaries, operating in the mortgage loans market to have perverse incentives.

The Dodd-Frank Act also introduced the Office of Credit Ratings (OCR)\textsuperscript{80}, which oversees and monitors the rating agencies operating in the country to prevent that these agencies may provide inaccurate or misleading ratings due to the existence of potential conflicts of interest with any of their customers.

The last of the main aspects introduced by the Dodd-Frank Act is known as the "Volcker Rule". In this regard, the rule prohibits banks to carry out certain investments with their own treasury, in which were included investments in hedge funds or private equity funds, among others. In practical terms, the Volcker rule prohibits banks to engage in proprietary trading activities on any type of asset, as it believes that such activities not only do not benefit customers, but it also may endanger their interests.

2.4.1.10 Jumpstart Our Business Startups Act of 2012

The last of the major laws affecting all those hedge funds that conduct their operations in the United States is none other than the Jumpstart Our Business Startups Act, known as JOBS\textsuperscript{81}, introduced by the government of Barack Obama in 2012. As noted before,

\textsuperscript{78} For more information about this agency, it is recommended to visit its own website at the following link: \url{http://www.treasury.gov/initiatives/fsoc/Pages/home.aspx}
\textsuperscript{79} To delve more on this government agency, it is recommended to access its own website at the following link: \url{http://www.consumerfinance.gov/}
\textsuperscript{80} If you want to access to all the relevant information concerning the Office of Credit Ratings, please visit its own website at the following link: \url{http://www.sec.gov/ocr/}
\textsuperscript{81} You can access to a digital version of the law through the following link: \url{http://www.gpo.gov/fdsys/pkg/BILLS-112hr3606enr/pdf/BILLS-112hr3606enr.pdf}
the Jumpstart Our Business Startups Act\textsuperscript{82} is aimed at helping start-ups and small and medium enterprises of the US to obtain financing in a much more efficient and less costly way, to thereby positively impact in job creation and in the economic activity. Also, it must be noted the impact that had on the hedge fund industry the lifting of the ban that had these investment vehicles to advertise in traditional media distributed to the general public. In this regard, and thereafter, hedge funds are allowed to advertise any type of private placement that they plan to carry out but, however, these securities only could be offered to accredited investors.

\textbf{2.4.2 Regulation in the United Kingdom}

After having analyzed in depth the existing legislation in the United States responsible for regulating the various activities undertaken by hedge funds, it is time to move to observe the existing legislation in the United Kingdom\textsuperscript{83}. This aspect is important because, as noted before, after the United States, though at a considerable distance, UK ranks as the second country in the world in which more assets under management have hedge funds.

In the European country, the highest authority in charge of supervising the financial markets until 2013 was the Financial Services Authority, commonly known as the FSA\textsuperscript{84}, which had a relatively short life, since it was formed in 1997 as a result of the merger of diverse independent groups in charge of oversight the financial markets that existed at that time\textsuperscript{85}.

Among its objectives, which had some obvious similarities with the ones of the SEC, were increasing confidence in financial markets of the UK; to protect the interests of investors; helping to preserve financial stability; as well as trying to reduce and avoid, as far as possible, any kind of criminal conduct that could be performed by any member of the financial markets of the United Kingdom.

In its early years, the FSA introduced a number of mechanisms that affected the existing hedge fund industry in the UK. The first aspect to consider is the fact that all those hedge funds that choose to be registered in the UK will face tax obligations on both capital gains and income obtained, which forced many of these investment vehicles to move their operations to other countries where the law was more favorable to their interests.

\textsuperscript{82} If you want to delve more into other aspects of this law, such as initiatives, amendments or reforms pending of introduction, please visit the website of the SEC at the following link: http://www.sec.gov/spotlight/jobs-act.shtml
\textsuperscript{83} Lhabitant, F.: \textit{Handbook of Hedge Funds}, p. 86-87, Wiley, 2006
\textsuperscript{84} For more information about the now defunct FSA, please visit its old website at the following link: http://www.fsa.gov.uk/
\textsuperscript{85} http://www.fsa.gov.uk/about/who/history
In addition, and as expected, the FSA did not have at that time any authority to supervise the activities of hedge funds that decided to register in other jurisdictions, so in these cases the main activity carried out by the agency was none other than to monitor all the marketing activities that were conducted within the borders of the United Kingdom by this type of investment vehicles, in order to verify that such activities were carried out according to the existing legislation, thereby protecting the interests of investors. In this regard and, as happened in the United States until 2012, hedge funds were not allowed to advertise their activities in general media intended for the general public, so that marketing needed had to be conducted through intermediaries or through private placements directed to professional clients or eligible counterparties\(^86\), as they were defined by the FSA.

For those cases where managers decided to establish their hedge funds in the UK, the FSA was responsible of granting authorization to operate in the country according to what was contained in the Financial Services and Markets Act introduced in 2000\(^87\). To grant an authorization, the FSA carried out an assessment both at the inception of the fund, as well as on a recurring basis, in which were evaluated, among other things\(^88\), the capacity of a given manager to carry out the mandate of the fund properly and, consequently, to achieve the different objectives outlined; the existence of mechanisms and appropriate internal control procedures to carry out the necessary activities and to fulfill the mandatory contractual obligations; the use of appropriate procedures for carrying out the necessary requirements to meet the existing regulations in the country; as well as maintaining a complete record of operations carried out by the fund and the materials distributed to investors.

During the global financial crisis that began in 2007, which had a very negative impact on the UK economy, the FSA carried out several actions in which there was even a temporary ban on short selling, aimed to protect the interests of investors and to maintain the stability of the UK financial system but, however, was heavily criticized for being too permissive with some banks years before, because many of them implemented several activities that ended up having very negative consequences for the interests of the British economy. Some of these problems, which were exacerbated following the onset of the crisis, were the rise of unemployment to very high levels; bailouts of several financial institutions by the British government\(^89\); as well as a strong stagnation and subsequent decline of the British housing market.

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\(^86\) To access to a detailed definition, as well as to a listing of eligible counterparties, as defined by the FCA, the agency that replaced the FSA in 2013, you can visit the website of the agency at the following link: [http://fshandbook.info/FS/html/handbook/COBS/3/6](http://fshandbook.info/FS/html/handbook/COBS/3/6)

\(^87\) You can access to a digital version of the law in the website of the British Government at the following link: [http://www.legislation.gov.uk/ukpga/2000/8/contents](http://www.legislation.gov.uk/ukpga/2000/8/contents)


\(^89\) However, there were some other big British banks such as Barclays and HSBC that didn't receive any financial help from the British government, as they were able to obtain additional financing through private placements and because they managed to move capital from other divisions that they had abroad.
In 2013, the FSA was abolished by the British government and replaced by two new agencies: the Financial Conduct Authority (FCA) and the Prudential Regulation Authority (PRA), which were created by the Financial Services Act introduced in 2012, aimed to meet the responsibilities and to fulfill the objectives that previously had the FSA.

The following figure shows the roles of the new agencies in the new UK regulatory framework.

Figure 11: Roles of the agencies in the new UK financial regulatory framework

Source: Compiled by author based on information from "The new UK regulatory framework", Wipro.

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90 You can access to a digital version of the law in the publicly available website of the British government at the following link: [http://www.legislation.gov.uk/ukpga/2012/21/contents/enacted](http://www.legislation.gov.uk/ukpga/2012/21/contents/enacted)
The Financial Conduct Authority (FCA)\textsuperscript{91} was created to regulate the existing financial industry in the UK. Basically, we can say that it is the British equivalent of the SEC although, in the case of the FCA, it is noteworthy that is not funded by the British government, but by the funds charged to the members of the British financial services industry. In this regard, the main objectives of this independent agency are to protect the interests of investors; to secure and preserve the stability of the British financial markets; to promote a healthy and stable competition between financial service providers operating in the country; as well as to conduct surveillance tasks in order to prevent the development of fraudulent and criminal activities within the financial services industry, among others.

Along with the above mentioned agency, the Act also created in 2013 the Prudential Regulation Authority (PRA)\textsuperscript{92}, which is part of the Bank of England\textsuperscript{93}. This agency is responsible for carrying out several tasks related to prudential regulation and supervision of financial institutions operating in the UK, such as banks, savings banks, credit unions, insurance companies, as well as any other firm that conducts financial services. To accomplish this task, the Prudential Regulation Authority (PRA) is responsible for setting mandatory standards and to carry out the supervision of any of the entities included in the above categories in an individual way, in order to avoid similar situations to the ones that emerged during the financial crisis started in 2007. In this regard, the agency performs various tasks framed within the monitoring task in trying to assess the various risks that may arise in some companies that could jeopardize the British economy, and that may impede the achievement of the objectives set by it, in order to prevent possible problems that may appear and, in some other cases, to solve those problems if they were not accurately predicted.

Regarding the main objectives of the Prudential Regulation Authority, it must be said that there are two, as reflected in its own statutes. On the one hand, the agency seeks to promote not only the safety, but also the strength and future stability of all the supervised financial institutions, with special attention on those entities which have a systemic character and. On the other hand, and intended specifically to insurers, the PRA is aimed to establish certain special mechanisms and procedures in order to protect the interests of policyholders. This aspect seems fundamental when protecting the stability of the UK financial system because, among other measures, those firms are required to maintain minimum levels of capital and liquidity, in order to avoid similar meltdowns to those that occurred in various parts of the world, including the United Kingdom.

\textsuperscript{91} In order to access to any information about the agency, either about its objectives, organization, events and even news, among other things, please visit its own website at the following link: http://www.fca.org.uk/
\textsuperscript{92} For more information about this agency, it is recommended to visit its own website at the following link: http://www.bankofengland.co.uk/prad/Pages/default.aspx
\textsuperscript{93} In fact, the governor of the Bank of England is one of the Board members of the agency.
In addition, the agency conducts an assessment of both current risks, as well as future problems that may arise due to bad practices, being this task also really important because, usually, it often tries to detect potential sources of future problems in early stages in order to solve the situation as quickly as possible.

Along with the main objectives mentioned above, there is another secondary objective that in turn is subordinated to the first objective of the agency, which is none other than to promote and facilitate competition in the financial markets in the UK. However, this secondary objective entails some difficulty when being implemented, since the agency must be aware that, as a result of some of the actions carried out aiming to achieve its main objectives, it is likely to have negative effects on competition.

### 2.4.3 Regulation in Europe ex-UK

The situation of the hedge fund industry in Europe, with the exception of the United Kingdom, has had a very different evolution to that in other countries over recent decades. In the beginning, the vast majority of European countries established a number of restrictions and obligations to hedge funds, such as limitations on short selling, when carrying out their investments that were mainly intended to protect the interests of investors. This aspect, may explain why the vast majority of newly created hedge funds chose to be established in those countries where the legislation allowed greater flexibility to this type of investment vehicles. In this regard, countries like United Kingdom, Ireland and Luxemburg, were consolidated as the main hubs of hedge funds in Europe.

However, in recent years, many European countries have chosen to loosen the requirements and obligations required by current legislation to hedge funds in order to promote the growth of the industry, as well as to attract new initiatives. In this regard, it must be said that the huge increase in the supply and demand of this type of investment vehicles around the world in the last years, has greatly favored such decisions by national governments in many different countries of Europe. Nevertheless, it must also be said that the great development that has taken the UCITS funds industry in recent years has been an impediment to the growth of the hedge fund industry in Europe, since a large number of alternative fund managers have chosen to operate through UCITS funds due to the many advantages that this type of investment vehicles have over other structures, being particularly relevant the possibility of being distributed in all the member countries of the European Union after having received an authorization.
Given the large number of existing countries in Europe, this section will focus only on analyzing the main regulatory issues affecting the hedge fund industry in the major countries of Europe.

- **Austria**: The existing legislation in Austria allows funds of hedge funds to be distributed to both retail and institutional investors. However, the regulation does not allow the establishment or distribution of domestic single-manager hedge funds, although it allows the distribution of foreign single-manager hedge funds, but only if they have been authorized by the Financial Market Authority (FMA). In this regard, and in order to receive an authorization, foreign hedge funds must meet certain conditions that are aimed at protecting the interests of investors.

- **Belgium**: Belgium is one of the most restrictive countries across Europe for hedge funds. In this regard, the existing legislation in the country establishes three types of collective investment institutions, which are supervised by the Financial Services and Markets Authority (FSMA). On the one hand, public ICUs can only be distributed to retail investors, although they can invest in hedge funds if they meet strict features, such as being guaranteed. On the other hand, institutional ICUs, as its name suggests, can only be distributed to institutional investors. Finally, private ICUs are aimed at high net worth investors, as they require a minimum investment of €250,000. Also, they must be distributed through private placements. In the latter two cases, the Belgian legislation allows hedge funds to be distributed, but only if they require a minimum investment of €250,000 and are distributed through private placements.

- **Denmark**: In Denmark, the legislation provides that domestic hedge funds must be established as "hedge associations", which must be approved by the Danish Financial Supervisory Authority (FSA). Furthermore, the depository of these associations must be a bank registered in Denmark or at least with an office in the country, as long as it is registered in any country of the European Union. In addition, all foreign hedge funds must obtain authorization in order to be distributed, as well as to operate within the country.

- **Finland**: As in other European countries, in Finland, hedge funds are allowed to be distributed to institutional investors after having submitted a notification to

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95 *Hedge Funds Whitepaper*, PWC, 2010
96 The regulation, taxation and distribution of hedge funds in Europe: Changes and Challenges, PWC, 2006
98 For more information on the FMA, you can visit its web at: [https://www.fma.gv.at/de/startseite.html](https://www.fma.gv.at/de/startseite.html)
99 You can access to the website of the FSMA at the following link: [http://www.fsma.be/en.aspx](http://www.fsma.be/en.aspx)
100 You can visit the FSA website for more information at: [https://www.finanstilsynet.dk/en/](https://www.finanstilsynet.dk/en/)
the Finnish Financial Supervisory Authority (FFSA). However, hedge funds that want to be distributed to retail investors must obtain authorization from the FFSA, for which they must meet certain requirements, such as the existence of proper supervision of the fund in its home country, among others.

**France:** The French legislation dictates that all funds that wish to make investments in hedge funds must obtain authorization from the Financial Markets Authority (AMF). Furthermore, within the country, hedge funds are regulated as "Authorized Investment Funds with Simplified Rules" (OPCVM-ARIA) or as "Contractual Mutual Funds" (OPCVM contractuels). In this regard and, in order to manage OPCVM-ARIA funds, it is not required any approval. However, in order to manage “OPCVM contractuels”, it is required a prior authorization by the AMF.

There are 3 types of "OPCVM-ARIA". On the one hand, "simple funds" must meet certain requirements and obligations, such as a minimum level of diversification and a maximum leverage of a 200% of their net assets. Moreover, such funds require a minimum investment of €125,000 as a general rule, or of €10,000 provided that the individual has a net worth of at least 1 million EUR or relevant work experience of at least one year. On the other hand, "leveraged funds" have the same obligations than simple funds, although in this case, they can leverage up to a 400% of their net assets. Finally, there are funds of hedge funds, which may leverage up to a 200% of their net assets, and that are required to make investments in at least 16 funds. In this case, the legislation does not require a minimum investment, as long as capital preservation is guaranteed. However, in other cases, the minimum investment must be of €10,000.

On the other hand, the "OPCVM contractuels" have no obligations or restrictions regarding to the diversification of their investments, nor regarding to the level of maximum leverage. In this case, the minimum investment required is of €250,000 as a general rule, or of €30,000 for individuals with a net worth of at least EUR 1 million or one year of relevant work experience.

**Germany:** The German legislation applicable to the hedge fund industry prohibits single-manager hedge funds, both domestic and foreign, to be distributed among retail investors in the country. However, foreign funds of hedge funds may be distributed in Germany, but only if they are registered with the supervisor of the financial industry of the country (BaFin). In the latter case, the registration will be allowed only if the supervision of the fund of hedge funds in its country of origin is effective, as well as if the regulator is willing to cooperate with the BaFin if it is necessary. On the other hand, single-manager hedge funds may have a prime broker or administrator registered in another country of the European Union, as well as an investment manager registered in

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99 For more information on the AMF, you can visit its website at: [http://www.amf-france.org/](http://www.amf-france.org/)
100 More information on the BaFin at: [http://www.bafin.de/EN](http://www.bafin.de/EN)
another country, either from the European Union or a third country, provided that they are properly supervised in their country of origin.

- **Ireland**: The Irish regulation is one of the most flexible and advantageous for hedge funds, which largely explains the growth in the number of funds registered in the country in recent years. In this regard, the Irish regulation facilitates and greatly reduces the approval process of hedge funds by the Central Bank of Ireland (CBI)\(^\text{101}\), in the same way that it is particularly flexible regarding the different activities allowed to these investment vehicles. In addition, some alternative vehicles, such as funds of hedge funds, do not require a minimum level of investment to retail investors, which increases the attractiveness of such funds.

- **Italy**: All those hedge funds, both foreign and domestic, that want to operate or be distributed in Italy must obtain authorization from both the Bank of Italy and the CONSOB\(^\text{102}\), the latter being responsible for regulating the distribution of hedge funds in Italy. In this regard, hedge funds are prohibited from conducting public marketing activities, in the same way that the minimum investment required by this type of investment vehicles is of €500,000. In addition, the number of shareholders must be limited to a maximum of 200. On the other hand, the depository of domestic hedge funds must be an Italian bank, or a bank registered in a member country of the European Union, but only if it has a branch in Italy.

- **Luxembourg**: Along with Ireland, Luxembourg is the European country with the highest number of hedge funds, mostly due to the many advantages offered by its legislation to these investment vehicles. In this regard, retail investors are allowed to make investments in hedge funds and in funds of hedge funds, but only if the fund has been approved previously by the CSSF\(^\text{103}\), for which the oversight of the fund in its country of origin must be adequate. In addition, all those hedge fund managers that have been authorized to operate in Luxembourg, will not need any additional authorization every time that they launch a new fund. Also, it must be highlighted that the existing legislation in Luxembourg is very flexible regarding to the activities allowed to hedge funds compared to other countries.

- **Spain**: In Spain, hedge funds can be established as “IIC de Inversión Libre” (hedge funds) or as “IIC de IIC de Inversión Libre” (funds of hedge funds). In this regard, single-manager hedge funds may only be distributed to qualified investors, but only if the minimum investment is of €50,000. Also, retail investors are allowed to subscribe shares of funds of hedge funds, provided that such funds of hedge funds meet certain characteristics. On the other hand, the

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\(^{101}\) You can visit the CBI website for more information at: [http://www.centralbank.ie/](http://www.centralbank.ie/)

\(^{102}\) For more information on the CONSOB, you can visit its website at: [http://www.consob.it/](http://www.consob.it/)

distribution of foreign hedge funds among Spanish investors requires prior authorization from the CNMV\textsuperscript{104}.

- **Switzerland**: Even though Switzerland is one of the main financial centers of the world, mainly due to the banking secrecy, as well as to the tax advantages that its legislation allows to those individuals who opt to deposit their funds in one of several banks operating in the country, it must be noted that the legislation responsible for regulating the hedge fund industry does not favor the establishment of this type of investment vehicles in the country. In this regard, retail investors are allowed to make investments in unregulated closed-end funds of hedge funds, as well as in domestic open-ended hedge funds or funds of hedge funds regulated by the IFA\textsuperscript{105}. In addition, they are also allowed to make investments in foreign hedge funds, but only if the fund has an authorization from the IFA to be distributed in the country. However, hedge funds or funds of hedge funds that have not been authorized to be publicly distributed in Switzerland, may also be subscribed by institutional investors through a private placement, as well as by any type of investor if certain requirements are met.

2.4.4 Regulation in Asia

After examining in detail the existing regulations in the two economies considered as the two major global financial centers and in which, as mentioned before, are managed mostly of the assets of the hedge fund industry, it is worthy to briefly highlight the situation in the main financial centers that exist in Asia\textsuperscript{106}, in which the hedge fund industry has experienced a strong growth in recent years due to the fact that existing laws in several regions are aimed to favor the creation of this type of investment vehicles in the area\textsuperscript{107}.

Within the Asian territory, there are certain areas where hedge funds have a significant presence, which has become even more pronounced due to the great number of opportunities that have arisen in some of the emerging economies of Asia in recent years. These regions are Hong Kong, Singapore, Japan, China, and even Australia, being particularly important the first two after the decline suffered by the industry in Japan, among other things motivated by the economic situation that the country has experienced in recent times.

\textsuperscript{104} You can access to the website of the CNMV at the following link: \url{https://www.cnmv.es/}

\textsuperscript{105} For more information on the IFA, you can visit its website at: \url{http://www.ifa-switzerland.ch/}

\textsuperscript{106} Lhabitant, F.: *Handbook of Hedge Funds*, Wiley, 2006


\textsuperscript{107} Some of the most prestigious hedge funds, all of them with AUM of more than 1 billion USD, that are based in the Asian region are Value Partners, Sparx, Hillhouse Capital, Azentus, Myriad, Senrigan, Turiya, Prime Capital, Horizon, Indus or Dymon, among others.
Particularly important has been the development of the industry in Hong Kong, due to the minimal existing regulation on the financial sector, as well as due to the relatively low costs of creating such structures, which has fostered the creation of a great number of hedge funds, many of which are carrying out long/short equity strategies, and the rapid growth of those more successful, also motivated by the possibilities of access to the Chinese economy that allows the area. In addition, many hedge funds that have appeared in Hong Kong in recent years have been launched with the support of large US financial groups, due to the introduction of the Volcker Rule that has forced them to separate their proprietary trading activities from their core business.

Along with Hong Kong, also in Singapore has grown greatly the hedge fund industry in recent years, due to the various incentives promoted by the government aimed to attract capital from all over the world to the region, as well as due to the low cost of creation and subsequent daily operation of the fund, in addition to high level services offered in the area. Moreover, and as it happens in the case of Hong Kong, by being based in Singapore, hedge funds have access to a great number of opportunities that may arise in the region, which has experienced very high growth rates compared to those obtained by the developed economies. In this regard, it must be noted that recent studies concluded that “hedge funds with a physical presence (head or research office) in their investment region outperform other hedge funds, and that the local information advantage is pervasive across all major geographical regions, but is strongest for emerging markets funds and funds holding illiquid securities (Teo, 2009).”

Along with all the above, it is important to note also that in the case of Singapore has particularly increased the number of hedge funds that implement strategies seeking to exploit opportunities in the bond, commodity and currency markets, in part due to that many of the desks that large investment banks had in the region were specialized in these assets. 

2.5 STRATEGIES

Hedge funds carry out a great variety of strategies\textsuperscript{109} that usually have little or nothing to do with those implemented by the traditional asset management industry. All these strategies, which will be examined below, are aimed to obtain absolute returns superior to those obtained by the market. However, there are marked differences between the various strategies implemented by the various hedge funds existing throughout the world, with some of them having a very high level of complexity that require state of the art technology in order to be implemented.

On the other hand, it must be made clear that there is no universal classification of all strategies that, today, are implemented in the world of the alternative asset management. However, and to facilitate the study of all these strategies, there are certain hedge fund indexes showing the returns obtained by each of the diverse strategies implemented, so that these indexes are often used as a starting point when examining the different existing strategies\textsuperscript{110}.

2.5.1 Long/short equity

The first of the strategies analyzed is not only the most known by the general public, but also the preferred one of a great number of hedge funds operating worldwide. This strategy is none other than the so called "long/short equity" (L/S equity) strategy, which is the first of the strategies that were launched in the hedge fund industry, being its main promoter Alfred Jones, as it was mentioned when an analysis of the historical evolution experienced by hedge the fund industry was carried out.

The aim of this strategy\textsuperscript{111} is to create a combined position of long and short equity positions that minimize the risks, while trying to achieve higher returns than the market. To do so, the fund carries out a deep fundamental analysis of a large number of companies, or firms belonging to specific sectors of the economy if the fund is focused exclusively on some sectors, in order to determine the fair value of the stocks according to the analysis conducted to, then, determine which stocks are overvalued or undervalued. In addition, and in some cases, the fund carries out technical analysis on the stocks in order to confirm the results of the fundamental analysis, as it often serves to determine whether it is or not a good time to invest in some of the stocks analyzed.

\textsuperscript{109} Stefanini, F.: Investment Strategies of Hedge Funds, Wiley, 2006
\textsuperscript{110} Some of the most recognized and used hedge funds indexes are the ones of Lipper Tass, Credit Suisse/Tremont, Hedge fund research, Barclay hedge, Hennessee or Hedge fund intelligence, among others.
\textsuperscript{111} Leibowitz, M., Emrich, S., Bova, A.: Modern Portfolio Management: Active Long/Short 130/30 Equity Strategies, Wiley, 2009
Once the manager knows the results of the analysis carried out, either by analysts of the fund or by research analysts of its prime brokers, he will take long positions in those securities that are undervalued and will sell short those stocks of companies that are overvalued, as shown in the following figure.

![Figure 12: Sell & Buy Zones in a Long/Short Equity Strategy](image)


Apparently, the strategy is relatively simple to put into practice, particularly for those investors with a level of assets managed relatively important, since taking short positions involves meeting certain requirements, which vary depending on the market in which the positions are taken, being this an important fact to understand why short positions are not so common among the vast majority of retail investors. However, and as noted before, investing is more an art than a science so, even if the strategy may seem simple on paper, it is not an easy task to obtain positive and steady returns over time by using this strategy, as demonstrated by the great number of hedge funds that have disappeared since it was first put into practice by Alfred Jones.

The combined position will allow the hedge fund to make a profit if the purchased securities have outperformed the securities that were sold short or, in other words, if the undervalued securities in which the fund has taken long positions have had higher returns than the overvalued securities that the fund sold short. Also, it is important to understand the fact that, with this strategy, the fund does not make or lose money depending on what the market do, but it will depend solely on the relative performance between long and short positions.

Another way to implement this strategy, particularly in those cases where the fundamental analysis previously conducted shows clear signs that certain companies are
undervalued relative to the market, is to take long positions in these companies and to sell short a future of the index in which those companies are listed, so the fund will make a profit if the undervalued companies purchased are able to outperform the market as a whole. This way of implementing the strategy saves time and money to the fund, as analysts only have to be sure about which companies will perform better than the market, understood as the index in which these companies are included.

Also, it must be highlighted the fact that, in a long/short equity strategy, we must distinguish between what is meant by gross exposure and by net exposure. Gross exposure, which usually is given in relative terms, is simply the sum of the percentages that represent the long and short positions. In other words, the gross exposure of a hedge funds is equal to the sum of long and short positions in absolute value, all divided by the total assets of the portfolio. In this regard, if the gross exposure of a fund is greater than a 100%, it will be said that the fund is operating leveraged, being the usual leverage twice its assets or, in other words, a gross exposure of a 200%. The following figure shows the difference between gross exposure and net exposure.

![Figure 13: Difference between gross and net exposure](image)

On the other hand, the net exposure is defined as the difference between the long and short positions divided by the total assets of the fund. That is, the net exposure is just the difference, measured in percentage terms, between the long and short positions of the fund. If the net exposure is positive, the fund is net long, while if it is negative, it is net short. Obviously, a fund that has a net positive exposure has an optimistic view of the market, while one presenting a negative net exposure is pessimistic about the expected behavior of the market.
Funds tend to adjust their long and short positions depending on the risk of the securities that compose these positions. To perform this task, they also consider the beta of the stock, which is a measure of non-diversifiable risk calculated mathematically by the ratio of the covariance between the market and the stock returns, and the variance of the market returns. In this regard, those stocks that have a beta higher than 1 exhibit greater volatility or risk relative to the market, while those who have a lower than 1 beta will be less volatile compared to the market. This metric is used by hedge funds when calculating their beta adjusted exposure, which is calculated as the difference, in relative terms, between long positions multiplied by their beta and short positions multiplied by theirs.

Usually, the main sources of return of this strategy are diverse. First, the fund will make money if the shares in which the long positions are taken go up in price, as well as if the stocks that have been sold short fall, since in this case the fund will cover its short positions at a lower price. In other words, and if the analysis is performed in relative terms, the fund will be able to achieve a higher return if the spreads between the returns of long and short positions widen. However, these two sources of returns are not the only ones to consider when carrying out a long/short equity strategy, but there are other important aspects.

The first of these aspects are dividends paid by the securities in which the fund has positions, either long or short. For those securities in which the fund is long, dividends will be a source of additional returns, as they are paid to the holder of the shares, being the returns even greater if the company decides to increase the dividend while the fund remains long in the stock. On the other hand, in the short positions, the fund will have to pay all the dividends obtained to the lender of the shares, so that an increase in dividends paid by a stock will mean a reduction in returns, while a reduction or elimination of dividends paid by a company will increase the profitability of the position. This aspect can also be analyzed in relative terms, so that the position will achieve a higher return if the spreads between dividends paid by companies in which the fund is long and the companies whose stock is sold short increase. In other words, the fund will make more money if dividends obtained from long positions increase and dividends paid by companies in which the fund is short decrease.

Another important aspect to consider is the fact that the fund may in turn lend the shares in which it has taken a long position in order to gain extra income. To do this, first, the shares are loaned to the counterparty who has decided to sell short. Then, the funds raised by that short selling are posted as collateral\(^{112}\) to the counterparty that has made the loan, which in turn invests the funds usually at the risk free interest rate. Finally, the

\(^{112}\) It must be said that, depending on the market in which are carried out the short sales, it may exist some requirements that may require to post additional collateral. An example is the US market, as the Regulation T requires that, in addition to the funds raised by the short sale, it must be posted an additional collateral of the 50% of the funds raised.
lender of the shares will pay the interest earned on the collateral to the individual who sold short, but after deducting a certain percentage of those interests, known as the borrow rate, which is the payment for lending the shares. Also, it must be said that the lender is entitled to call the shares back at any time, provided there is not any additional clause in the loan agreement signed by both parties, regardless of whether it is negative or positive to the interests of the party that sold short the shares.

Just as in the previous case, only that this time the analysis will be performed from the perspective of the counterparty that decided to sell short, the fund may also receive part of the interests earned on the collateral delivered to the lender of the shares. In other words, once the fund has sold short certain securities, it will deliver the proceeds from the sale to the party who has lent the shares, which will invest such funds at the risk free interest rate, to then pay the fund some of the interests earned after deducting the borrow rate.

The last of the additional sources of return of a long/short equity strategy refers to the existing exchange rate between the currency in which are denominated the shares in which the fund has taken long and short positions, and the local currency of the country in which the hedge fund operates, which is generally the US dollar. In this regard, the fund will achieve additional returns if the currency in which are denominated those shares in which the fund has taken long positions appreciates, and the currency in which are denominated the shares that have been sold short depreciates.

Finally, the main disadvantages of a long/short equity strategy are the high costs of implementing it, because in order to be effective the fund must take a high number of positions; the high number of orders needed to keep the portfolio within the desired objectives, which in turn has a direct impact on costs; and the fact that the hedges of the long and short positions will prevent higher returns in times when the market is bullish or bearish\textsuperscript{113}, among others.

### 2.5.2 Equity market neutral

This strategy\textsuperscript{114} is derived from the previously analyzed, but in this case the manager tries to avoid having any correlation between the managed portfolio and the market or, in other words, he will try to achieve an adjusted beta exposure of the portfolio close to zero, in the best case, or a portfolio with no bias towards long or short positions.

\textsuperscript{113} If the market is in a bullish momentum, short positions will impact negatively in the profitability of the strategy, while if it is in a bearish momentum, the long positions will be the ones that will have a negative impact.

The main difference between the equity market neutral strategy and the long/short equity strategy lies in the fact that, while a specialist in long/short equity will have a portfolio in which the weight of the long positions will be usually greater than the short ones, or vice versa, in the case of a portfolio that is managed with an equity market neutral philosophy, the long positions and the short ones will be fully hedged, which is rather more complicated to carry out of what the theory says. However and, in this regard, it must be noted that certain studies concluded that “the dependence between hedge fund returns and market returns is often significant and positive, even for market neutral funds, so the diversification benefits from investing in hedge funds thus may not be as great as first thought (Patton, 2008)”.

The easiest way of neutrality is the so called dollar neutrality, which is achieved by a portfolio in which the long positions and the short ones have exactly the same value in absolute terms. In other words, if a given portfolio has long positions worth $100 million, the manager must take short positions in certain securities until those short positions will be valued at 100 million dollars, in order to achieve a dollar neutral portfolio. The main problem of this type of strategy lies in the fact that, as a result of the daily changes suffered by the prices of securities in which the fund has taken long and short positions, the manager must constantly re-balance the portfolio to maintain neutrality in monetary terms, which is something costly.

However, in the above case, the manager does not consider the fact that certain values, because of their higher volatility with respect to the market, add a higher level of risk to the portfolio. To solve this problem, the manager should consider the betas of both long and short positions, so that he will seek a portfolio with an adjusted beta exposure that is close or equal, at the very best cases, to 0. In this case and, like in the previous one, it will be needed to conduct a rebalancing of the portfolio, which also should consider the daily changes that will occur in the corresponding betas of the securities in which the fund has taken positions. On the other hand, if the portfolio, rather than equities, is composed of fixed income instruments, the manager will seek a portfolio with duration of 0 or close to 0, defined as the variation experienced by the price of the portfolio as a result of a given movement in interest rates.

On the other hand, this strategy may be also carried out considering a particular index, country, or even focusing exclusively on certain industries in which the portfolio managers can leverage their knowledge, so that in these cases they will only take positions in companies belonging to that industry. Also, they need to constantly analyze the various risks of the portfolio, such as market risk, interest rate risk, exchange rate risk, idiosyncratic risk, country risk and, in short, anything that can adversely affect the profitability of the portfolio. The following figure shows the main risks of an equity portfolio.
Another aspect to consider is that, due to the fact that the risks of long positions tend to be completely hedged by taking short positions in certain assets, this strategy usually achieve returns that are often lower than the achieved by other strategies, but in this case with a lower level of volatility or risk. In other words, what needs to be clear is that, if a given manager is able to eliminate all risks of a given portfolio, the profitability of the portfolio will be exclusively the risk free rate less all the various transaction costs incurred when building the portfolio, so that the more risks are removed from the portfolio, the less chances will have to manager to add value. In addition and, as happened in the case of the long/short equity strategy, in an equity market neutral strategy, the profitability of the portfolio is determined by the relative behavior that have the long positions with respect to the short ones.

When implementing the strategy, all the managers that specialize in an equity market neutral strategy usually make bets on various assets in pairs, which is known as pairs trading, which usually tend to be done in companies operating in the same sector, so that the manager will take a long position in the company that he thinks that have better fundamentals between the two; or by performing the so called statistical arbitrage, which involves taking long and short positions in a large number of securities, using for this highly complex proprietary statistical methods and mathematical algorithms that try to identify potential opportunities in many markets, either in cash securities or in index futures. In both cases, the philosophy is based on the fact that the stocks of two companies that have similar fundamentals, have to be trading at the same or at a very similar price, so opportunities will arise in those cases in which a certain security is trading at a price that is above or below the price of other securities of comparable

115 Stokes, E.: Market Neutral Investing: Build Consistent Low-Risk Profits by Creating Your Own Hedged Portfolio, Kaplan Business, 2004
companies with similar fundamentals. In this regard, certain studies concluded that this methodology “has potential applications to generating wealth from any quantities in financial markets which are observed to be out of equilibrium (Elliott, Hoek & Malcolm, 2005)”.

In other words, to achieve neutrality, an equity market neutral specialist who has taken long positions in companies of a given industry, will sell short companies belonging to the same industry or will take more long positions in companies of a different industry, or with an opposite style. Some examples might be the following ones: if a given portfolio has a positive beta in high-growth companies, the manager will short high-growth companies or will buy mature companies; if the portfolio has a positive beta in large cap companies, the manager will short large caps or will buy small capitalization companies; if the portfolio has a positive beta in companies whose shares are experiencing a bullish rally, the manager will short other companies that have experienced significant growth in price or will buy companies that have undergone a bearish rally; or if a particular portfolio have a positive beta in a particular industry, the manager will sell a future on an index of the industry or will buy an index of a competitor industry, among many others.

2.5.3 Dedicated Short Bias

Another strategy implemented by hedge funds but, in this case, not very well known by the general public nor widespread within the hedge fund industry, is none other than the so called "dedicated short bias" strategy\(^{117}\), which in turn is derived from the previous one.

Just as in the previous strategy, the fund's analysts will conduct a thorough analysis, either by applying fundamental analysis or technical analysis techniques, of a large number of companies in order to determine which ones are overvalued and which ones undervalued. Once detected the overvalued and undervalued companies, the manager will focus exclusively on those that are overvalued, whose shares will be sold short in order to repurchase them back once they have fallen in price. In other words, the manager will maintain a net short exposure that will be higher or lower depending on the hedges that he wants to maintain.

When seeking companies that are potentially candidates to be sold short as a result of both the current situation of the company and the future prospects, analysts tend to examine several variables of interest that will make a company to be a potential target to the fund. In this regard, analysts often look for companies where the share price is not justified by the current financial situation of the company or by its future prospects;

firms that do not meet the requirements required by the legislation of the country in which their shares are listed, or that usually have delays at the time of compliance; companies operating in industries with little potential for future growth or survival expectations; firms that have been target of a possible merger that ultimately ended in nothing; companies with their reputation damaged as a result of having carried out activities considered unethical or fraudulent; firms in which a large number of investors have sold short the shares of the firm\textsuperscript{118}, as well as companies operating in industries where competition is very high, with low barriers of entry, and with relatively small margins, among many other aspects.

A typical example of a short sale is shown in the following figure.

\textbf{Figure 15: Example of a short sale}

\begin{itemize}
  \item 1. The hedge fund borrows a security from a broker
  \item 2. The hedge fund sells the security back in the open market
  \item 3. Under Regulation T, the Federal Reserve requires short sellers to make a cash deposit in their margin account of 50% of the short sale value.
  \item 4. The hedge fund decides to close out the short position buying back the security on the open market.
  \item 5. Closing of the margin account.
\end{itemize}


\textsuperscript{118} This analysis is usually carried out by examining the short interest of the company, which refers to the number of shares that have been sold short but still have not been delivered. Along with this metric, it is usually analyzed the short interest ratio, which is calculated by the ratio of the short interest of the company and the average daily trading volume of the stock. The latter metric indicates the number of days it would take to cover all short positions, assuming that all daily transactions are used to repurchase shares to cover the short positions.
Usually, this strategy is often viewed in a great number of occasions, particularly if the investment universe of the fund is restricted to equities, as a long/short equity strategy in which the relative value of short positions is higher than the one of the long positions. However, there are some funds that specialize exclusively in taking short positions, in which it is not easy to see any long position aimed to hedge the risks of the short ones.

As discussed in the previous section, in which an analysis of the long/short equity strategy was conducted, taking short positions implies considering a great number of important issues when evaluating the various opportunities, as well as the different sources of return. Obviously, the main source of return will be a fall in the price of the shares sold short, because the fund will be able to buy back the shares at a lower price level in order to cover the short position. However, there are additional sources of return that must be considered.

The first of the additional sources of return obtained by a fund that implements this strategy refers to the part of the interests that it will have the right to receive as a result of having delivered the proceeds from the short sale to the lender of the shares as a collateral, which will be invested, usually, at the risk free interest rate. These funds will earn interests that, once discounted the cost of borrowing the shares, will be a source of return of the strategy.

Another aspect to consider are the dividends paid by companies in which the fund is short. In a short selling, the shares sold short are received on loan or, in other words, the fund is not the owner of them. Therefore, all dividends to which such shares are entitled, will be paid by the fund back to the lender of the shares, so if those dividends are reduced or even if the company decides to stop paying dividends, the strategy will allow the fund to obtain additional returns.

The last of the major sources of additional return of this strategy comes from the evolution of the exchange rate between the currency in which are denominated the short positions, and the currency of the country in which the fund operates, so that if the currency in which the shares that have been sold short by the fund are denominated depreciates relative to the local currency of the country in which the fund operates, the fund will achieve additional returns due to the currency effect.

Among the main disadvantages of this strategy are aspects such as the fact that, in contrast to what happens with long positions in which there is unlimited potential gains and limited potential losses, in a short position the maximum potential is limited to
while potential losses are unlimited; the risk that has the short counterparty of having the contractual obligation to return the shares at the time desired by the lender, regardless of the fact that the position may report losses; the possibility of having to face huge losses if the market gets into an uptrend; the fact that one company can increase or start paying dividends, which will be paid by the fund to the lender of the shares; the different margin requirements when conducting short sales that are required by each market; the cost of maintaining a short position, which will vary depending on the shares that are sold short; the limitations that often exist in certain markets when conducting short sales, such as the prohibition of carrying out these activities in situations where the price of a certain stock or index is falling heavily, and even temporary prohibitions of short selling as a result of a crisis; as well as the difficulties that exist in certain shares to locate individuals willing to lend their shares temporarily, which is usually quite common in certain small and medium size firms, among others.

2.5.4 Event driven strategies

Another of the many strategies implemented by hedge funds are those that are included within the category known as event driven, which is considered as one of the most attractive to many investors, particularly in those times of economic expansion where mergers and acquisitions between companies greatly increase. This strategy is also one of the oldest, because it has its origins in the 1940s, when the so-called risk or merger arbitrage strategy was implemented for the first time by Gustave Levy when he was working at Goldman Sachs.

These strategies are aimed to take advantage of different opportunities that may arise in corporate events and special situations of extraordinary nature such as mergers, acquisitions, leveraged buyouts, listings and delistings of a company in an index, legal disputes, relevant assets sales, agreements made by the company, share repurchases, restructurings, bankruptcies, liquidations, recapitalizations, business consolidations, and in general terms, any situation in which the capital structure of a given company undergoes major changes and where the value of the company is affected in one way or another.

- **Merger or risk arbitrage**: This strategy is also referred as risk arbitrage due to the fact that, in any merger or acquisition of a particular company by another,

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119 In a short position, the maximum profit is limited to a 100% that will be achieved only in the case that the shares sold short lose all their value. In other words, a fund will achieve the maximum return if, when covering the short position, it has to deliver back shares that are worthless.

120 Those companies in which there are lenders of shares willing to lend their securities at reasonable prices are known as easy or cold names, while those in which an investor has to face higher costs when borrowing shares are known as hard or hot names.

121 During the financial crisis that began in 2007, there were several countries, including the United States and Spain, among others, in which short selling activities were banned temporarily.


There is uncertainty due to various aspects that may cause a failure of the deal. This strategy will allow the hedge fund to achieve significant returns if it has been able to anticipate the outcome of any corporate event and has taken the right positions based on such analysis.

Operationally speaking, the first step when implementing this strategy is to identify companies that are the subject of a merger or acquisition by another company, for which there are several databases that can be used for this purpose, where the manager can also access to related information, like corporate events occurred in the past. Once having identified the companies that are subject to various corporate events that may lead to different opportunities for the fund, the managers will conduct a thorough analysis of all the information that, in one way or another, may affect the outcome of the corporate event.

In this regard, it must be said that, according to some studies, “in most market environments, risk arbitrage returns are uncorrelated with market returns. However, during market downturns, the correlation between market returns and risk arbitrage returns increases dramatically, which suggest that risk arbitrage returns are similar to those obtained from writing uncovered index put options (Mitchell & Pulvino, 2001)”.

In the event that a particular company intends to acquire or even can become acquired by another, the strategy of the fund may be of two types. Furthermore, the fund may choose to take a position before the transaction is announced publicly, which is not usual as it would be based on hearsay or on insider information; or once the transaction has become public and known by all market participants.

If the fund, based on public information used in the analysis, concludes that there are high chances that the acquisition will be completed, will take a long position in shares of the company that will be acquired. The objective, in this case, is none other than ensuring the profit resulting from the premium that acquiring companies usually tend to pay when buying a particular company. This premium paid it is generally paid because, firstly, the acquiring company aims to gain significant control of the acquired company and, on the other hand, due to future synergies that will arise due to the acquisition.

If, however, the fund concludes that the likelihood that the acquisition will not be achieved is high, the managers will sell short the shares of the acquired company. In this case, the fund will seek to make a profit as a result of the fall in the price of the shares of the target company due to the failure of the operation. The funds that perform this type of bets are known as contrarians.


Some of the most used databases are the ones of Dealogic and Mergermarket, among others.
Moreover, this strategy also allows for additional returns in those events in which the offer made by the acquiring company for the acquired is not in cash, but in shares or in a mixture of cash and stock. However, the implementation of this strategy presents a slightly higher level of complexity than the above analyzed, as well as a higher potential return.

In the event that a particular company is willing to pay to the shareholders of the acquired company shares instead of cash, the strategy may be of two types. If the hedge fund determines that the chances of success of the merger are high, it will buy shares of the acquired company and will sell short shares of the acquirer because, usually, the market value of the shares that the acquiring company is willing to give for each share of the acquired company will be higher than the market price of the shares of the acquired company due to the premium paid. However, if this does not happen, which can occur in certain specific situations, the fund will sell short shares of the acquired company and will buy shares of the acquiring firm.

The fund will perform exactly the same strategy if, after consideration of all the public information, concludes that the event will fail. In both cases, the fund's objective is none other than pocketing the spread, from the time of announcement of the corporate transaction until completion, between the shares of the acquiring company and the price paid for the acquired. This spread will change as a result of the passage of time, so that the smaller is the spread, the more likely that such transaction will be closed, whereas if the spread is becoming bigger, the surer will be the market that the operation will not be successful.

Another aspect to consider is the fact that, in certain situations, in order to avoid having to cope with higher costs of acquisition from the point of view of the acquiring company, as well as to avoid getting a lower price from the point of view of the shareholders of the acquired company, both parties can choose to enter into a collar, being the most common one in which a maximum number of shares to be delivered and a minimum number is set.

From the point of view of the shareholders of the acquired company, the collar will consist of selling a call option to the acquiring company and receiving a put option. The strikes of both options indicate the maximum and minimum price they will receive for each share. If, at the time of closing out the transaction, the price of the shares of the acquiring company is above the strike of the call option, the shareholders of the acquired company will receive the minimum number of shares at the maximum price, which is equal to the strike of the option. If, however, the price of the shares of the acquiring company is, at the time of closing out the transaction, below the strike of the put option that have been sold to shareholders of the acquired company, the latter will receive the maximum number of shares at the minimum price, which is equal to the strike of the option. Finally, if the stock price of the acquiring company is situated
between the two strikes, the shareholders of the acquired company will receive a fixed number of shares of the acquiring company.

On the other hand, a company that is willing to acquire another company may also offer a combination of stock and cash. In this case, the analysis conducted by the fund is exactly the same as before, but with the difference that in this case it must be considered the value at which the acquiring company is valuing the shares acquired, which is calculated as the sum of the market value of the shares offered plus the extra cash. Once this value is known, it will be compared to the price at which the shares of the acquired company are trading in the market, and a long or short position will be taken depending on whether the price is below or above the value of the combination of shares and cash offered by the acquiring company.

As mentioned before, there are other corporate events in which opportunities may arise, such asRestructurings, leveraged buyouts (LBO),124 or even bankruptcies, among many others. In all of them, the philosophy is the same as the one of the risk arbitrage strategy, i.e., the fund must determine the price at which the acquiring company is valuing the shares of the acquired company, to then compare that value with the price at which the shares of the acquired company are trading in the market. However, the difference lies in the fact that, in certain corporate transactions, there is needed a more complex analysis and, particularly, a constant assessment of all the new information that may arise related to the event.

Additionally, there may be situations in which a company is both an acquirer as well as a target company, so in this case the fund should consider both operations, thus complicating the analysis. However, and to avoid heavy losses, when carrying out a risk arbitrage strategy the fund must also conduct an analysis of other aspects such as the chances of success and failure of the event; any potential losses; as well as the potential return of the strategy compared to the level of risk assumed.

Finally, the main risks of risk arbitrage strategies are aspects such as the type of bid, whether hostile or friendly; the premium paid, because if it is considered low, it will increase the chances of a failure; different mechanisms implemented by the companies that are the subject of an acquisition aimed to prevent such acquisition; the existence of potential competitors to acquire a company; investors carrying out the same strategy than the hedge fund, as this will reduce spreads and profit potential; the way in which the offer is made, which may not be desired by the shareholders of the target company; existing regulations and laws in certain countries, which may prevent certain companies buying others in

124 A leveraged buyout refers to an acquisition of a company financed mostly by issuing debt. Usually, the assets of the acquired company are used as collateral, in the same way that the acquired company is usually the one in charge of servicing the debt, so when conducting such operations the originators seek for companies with a high capacity to generate cash, low debt, with good quality assets, with low needs to make investments in the short/medium term, as well as with high growth prospects, among other things.
order to avoid monopolies or to take control of companies of protected industries; as well as the economic situation, since in times of crisis and with high interest rates the number of mergers and acquisitions is drastically reduced, among other things.

- **Activism in special situations**: Within event driven strategies, has gained particular relevance the activism of some hedge fund managers when it comes to influence the outcome of certain special situations such as mergers, acquisitions, bankruptcies, liquidations, spin offs, recapitalizations, share repurchases, special dividends, sale of significant assets, exits of certain key employees of the company, listings or delistings of a company of an index, leveraged buyouts, as well as disputes and agreements between various companies, among others.

In these cases, and instead of waiting for a situation to take its course and end up having a certain result, some managers choose to act and participate actively in order to force a desired outcome of the situation. These activists are characterized by being strong defenders of the interests of the shareholders of the company, as well as investors that try to get the maximum value creation for shareholders, for which they use all the means at their disposal with the aim of influencing managers and the board of directors of the company to force them to perform actions that are beneficial to the interests of the shareholders of the company. This aspect is particularly relevant in companies managed by members of a given family, since in these cases there are times where the dominant family chooses to perform certain actions that may not be the most advantageous for the interests of the other shareholders for the sole purpose of maintaining control in the company.

Due to the fact that, to influence certain situations, a hedge fund needs to have a relatively large control within the company, managers specializing in activism often join forces with other major shareholders, which are usually institutional investors, and even with other activist managers, in order to achieve a greater bargaining power and to force the managers of the company to carry out the actions that are most beneficial to their interests. However, there are times when, due to that the hedge fund does not have a sufficient number of shares of the company, as well as enough voting power to force the implementation of important decisions, the fund typically borrow shares in order to achieve a certain percentage of ownership, as well as to use the associated voting rights.

This strategy has its major advantage in the fact that managers, rather than trying to predict the outcome of a given situation, which is quite complicated and requires a thorough analysis of economic, financial or legal aspects, decide to take part in the situation and try to manage it in order to influence its outcome. Among the possible recommendations that activists managers often transmit to the managers of the companies are to implement strategic changes; to sell.

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business units or separate them to increase the efficiency of the company; the sale of assets not considered strategic and essential to carry out the main business of the company; as well as the distribution of cash available to the company in the form of dividends or through share repurchases, among others. Also, it must be noted that, in general, activist managers often try to carry out such actions and recommendations in a proactive and friendly way though, if they do not find a positive response to their interests by the management team of the company, they may become more aggressive and even, in certain situations, they will try to force out the entire management team.

Obviously, this strategy carries risks inherent of managing the situation and due to the possible position of rejection of some actions by certain shareholders, or even by the management of the company, so that the strategy may end up causing a loss in the case in which the situation finally ends up having a detrimental result to the interests of the fund.

Furthermore, there are also additional risks, such as concentration risk, because in order to gain enough power when voting certain decisions the fund must take a large position in the company; reputational risks, since in many occasions activist investors when finding their own benefit may harm the interests of other investors, thus leading to the rejection of a large number of individuals as a result of actions taken; liquidity risks, as once have taken significant positions in a given company, it is quite complicated to undo these positions relatively quickly without affecting the market price of the shares; the inability at a certain time to sell or buy shares of the company once the fund has become a major shareholder due to the existence of various clauses that introduce certain restrictions when increasing or decreasing the position in the company; or the inability to take advantage of certain opportunities that may arise because, as major shareholders, funds have access to confidential information that cannot be used when making investment decisions, among others.

2.5.5 Fixed income arbitrage

The fixed income arbitrage strategy\textsuperscript{126} is considered as the most flexible of all the strategies implemented by hedge funds due to the high number of sub strategies that fall within it. All these strategies have a common denominator, which is none other than the fact that the assets used are fixed income securities. These assets take their name of the fact that they allow investors to obtain an income on a regular basis, unlike other assets, such as equities, commodities or currencies, in which there is no guaranteed income.

The importance of fixed income securities in global capital markets is huge, since they are the assets with the largest outstanding volume, with a big difference if compared to equities. As a result, there are a large number of opportunities that can be exploited by


hedge funds by implementing different strategies aimed to achieve higher returns than the obtained by traditional asset managers.

- **Issuance driven arbitrage**: With this strategy, the manager tries to exploit the spread between the last issued bond, which is known as the on the run bond, and the bonds issued before that bond, due to the superior liquidity of the on the run bond compared to other bonds of the same issue. This liquidity is often viewed by investors as a positive aspect, hence this bond is more demanded than other bonds of the issue, so that the required return will be lower or, in other words, the bond will trade at a higher price. However, that on the run bond will not be on the run anymore since the moment in which the issuer carry out further emissions or, in other words, that bond will be less attractive after these emissions and, therefore, its price will fall as a result of the higher returns that investors will require to it.

Therefore, and to exploit the above mentioned situation, the manager will sell short the on the run bond, and will buy the previous on the run bond. Basically, the manager expects to make a profit because the on the run bond will be replaced sooner or later by other bond, and its price will tend to converge to the ones of the bonds previously issued. In short, the manager will bet that the existing differential at a given time between the previous on the run bond and the actual on the run bond tend to disappear.

- **Yield curve arbitrage**: In a yield curve arbitrage strategy, the manager tries to take advantage of opportunities that may arise as a result of movements in the yield curve, which reflects the different interest rates or yields of a specific fixed income instrument at different time periods. This curve changes its shape due to various aspects, such as the monetary policy implemented by the central bank of a certain country; the credit quality of the issuer; the supply and demand of the instrument; as well as due to the economic situation of the country where the instrument was issued, among others.

The possibilities to implement this strategy are various. Furthermore, the strategy can be implemented by using instruments that trade in the same market (intra curve) or that trade in different markets (inter curve).

First, the manager can make a bet that a given interest rate curve will be steepen. Therefore, and considering the inverse relationship between interest rates and bond prices, the manager will sell short those bonds that have a longer maturity and will buy bonds that have less maturity. The return of the strategy will be positive if, as a result of the greater slope of the yield curve, the long-term rates rise at a higher rate than short-term rates, which will reduce further the price of bonds that have a greater maturity than those with a lower maturity. In other words, as the price of bonds with greater maturities will fall more than those of the bonds that have less maturity, the strategy will make a profit. In short, the
A manager will make a relative bet between two bonds that will fall in price due to a rise in interest rates, but because the bond that has been sold short will fall further than the bond that will be purchased, the combined position will report a profit.

On the other hand, the manager can also bet that the yield curve will end up being more flat than the actual or, in other words, that interest rates in the long run will fall further than interest rates in the short term. In this case and, unlike the previous one, the manager will buy the bond with a longer maturity and will sell short the bond with the lower maturity. In this bet, the manager expects that the price of the bond with the higher maturity will rise further than the price of the lower maturity bond, so that the combined position will report a profit.

The last of the possibilities involves conducting a bet based on the analysis of the current yield curve and the curve expected by the manager, so that there will be times where the actual yield curve will be above the expected one, and others where it will be below. However, to implement this strategy, the yield curve must show a smoothed shape with at least one high or low. Therefore, the manager will operate on bonds that fall into the high or low, as well as on those falling to the right and left of such high or low. Operationally speaking, the manager will buy those bonds with maturities falling in times when the current rate curve is above the estimated (humps), and will sell short bonds with maturities falling in those moments when the current yield curve is below the estimated (troughs). The following figure shows an example of this strategy, which is known as a yield curve butterfly.

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127 Stefanini, F: Investment Strategies of Hedge Funds, p.139, Wiley, 2006
• **Carry trades**: Carry trades are one of the best known and implemented worldwide strategies. Operationally speaking, the manager will sell short a certain fixed income instrument to then, with the proceeds of the sale, purchase another instrument that pays a higher interest rate than the one that has been sold short. Therefore, this strategy will have as main objective to take advantage of the higher interest rate paid by the instrument purchased, which will be used also to face the interest rate that will be paid to the lender of the shares that were sold short.

A close example of carry trades are the operations performed by a large number of banks in the Euro zone, where they raised funds at very low rates in the European Central Bank, to then invest those funds in government bonds with higher yields. Another fairly common example involves selling short a bond of a government with less maturity and, with the proceeds obtained from the short sale, buy another bond of the same government with a longer maturity, which, due to the higher risk because of its longer maturity, will pay a higher coupon. This strategy is usually implemented with government bonds of countries in which the yield curve remains stable for all possible maturities, being quite common to use government bonds of the United States with maturities of 10 and 30 years.

Furthermore, and along with the above examples, in recent years and, given the zero interest rate (ZIRP) monetary policy implemented by the Bank of Japan in the last years, many hedge funds raised capital in Japan at very low rates to then invest those funds in buying government bonds of emerging markets such as Brazil, Mexico or Indonesia, among others, due to their higher yields; or United States treasuries, due to its attractive yield and its much lower risk.

• **Swap spread arbitrage**: Other of the several strategies implemented by hedge funds is aimed to exploit opportunities that may arise because of the spreads between the yield curve and the curve of interest rate swaps. The interest rate swaps are used by many companies for various purposes, but are mainly intended to hedge interest rate risk. However, and due to the fact that this type of instrument is agreed between two parties, there is a risk of default of one of the counterparties. This makes that the curve of interest rate swaps will reflect this risk by requiring higher interest rates when entering in one of these instruments. In other words, there is often a difference between the yields of the bonds of a given government and the interest rate asked by a broker to enter in an interest rate swap, so that the manager will seek to exploit opportunities that may arise due to a narrowing or a widening of these spreads.

The normal bet is usually based on the assumption that the spread between the two yield curves will tend to be lower. Operationally speaking, the manager will enter into an interest rate swap receiving a fixed interest rate and paying a floating rate. Also, he will sell short a bond that pays a fixed coupon and

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128 These types of instruments not traded on organized markets are known as OTC instruments.
subsequently will enter into a repo (repurchase agreement), which will finance
other counterparty with the proceeds from the short sale in exchange for the repo
rate. In short, the position will involve cash inflows and outflows, so it will
report a profit as long as the cash inflows are higher than the cash outflows.

The cash inflows will be equal to the sum of the fixed rate received on the
interest rate swap and the repo rate. On the other hand, the cash outflows will be
the floating rate payable on the interest rate swap plus the fixed rate payable on
the bond that was sold short. Obviously, the manager may also perform the
opposite bet, i.e. an expectation that the spread between the yield curve of
government bonds and the curve of interest rate swaps will widen. In this case,
he will carry out the opposite strategy than the mentioned above.

- **Futures basis trading**: Another of the several fixed income arbitrage strategies
is the one in which the manager tries to exploit opportunities that may arise from
the differences between the price of a future on a given bond and the cash price
of the bond\(^\text{129}\). This difference between the future price and the spot price is
called basis, so that the manager can place bets depending on whether he expects
that the spread will widen or will narrow.

Bond futures are contracts that obligate buyers to purchase an asset (and sellers
to sell that asset) at a future date and at a predetermined price. However, and
contrary to what happens with futures on equity indexes, futures on bonds
usually have a price that is determined based on the hypothetical delivery of an
imaginary bond, i.e., that does not exist in reality and that usually pays a coupon
of 6%. Due to the fact that the underlying bond does not exist, all bond futures
are created along with a list or basket of deliverable bonds, which in turn are
accompanied each of them by a metric known as the conversion ratio or
conversion price, which aims to adjust the final price to be paid by the
counterparty that is long the future upon maturity.

In other words, and as the bond that will be delivered will usually have a
different coupon than the underlying bond of the future, the price will need to be
adjusted to consider the difference. All this means that, if the delivered bond
pays a coupon that is lower than the 6% of the underlying bond, the conversion
ratio will be less than one, while if it has a coupon that is over 6%, the ratio will
be greater than one because the bond delivered will be more valuable.

Due to the existence of different deliverable bonds, there will always be one of
them that will be the cheapest to deliver (CTD) bond. This bond, not
surprisingly, will change until the expiration of the future contract. In an
environment where interest rates are below the interest rate paid by the
imaginary bond, the CTD bond will be a bond paying a higher coupon, but with
a lower maturity. Conversely, if interest rates are at higher levels than the

interest rate paid by the imaginary bond, the CTD bond will be a bond paying a lower rate than the imaginary bond, but with a higher maturity.

Therefore, the manager will take positions in bonds and in futures on these bonds in order to exploit potential opportunities that may arise. If the future is trading at a higher price than its fair value (trading rich), the manager will sell short the future and will go long the underlying bond while, on the contrary, if the future is trading at a lower price than its fair value (trading cheap), the manager will take a long position in the future and will sell short the underlying bond. The success of this strategy will depend on the ability of the manager to calculate the fair price of the future, which will be compared to the prices of the deliverable bonds, in order to determine which one is the CTD bond, to then analyze if there are opportunities or not, which is something that usually requires advanced proprietary mathematical models and the use of high level technology.

- **Capital structure arbitrage:** One of the strategies used by certain hedge funds, particularly by those that try to take advantage of opportunities that may arise in companies that are in difficult situations, is the so called capital structure arbitrage strategy. Capital structure refers to the various financial resources, either internal or external, that companies use when conducting their operations. All these instruments carry different priorities when claiming rights if certain situations arise in the company, such as defaults, bankruptcies or restructurings, among others. In other words, certain instruments have precedence to be recovered if the company defaults or ends up in bankruptcy. In this regard and, as may be seen in the following figure, the highest priority in all of those events will be for the bank debt, followed by senior secured bonds, senior unsecured bonds, senior subordinated bonds, subordinated bonds, junior subordinated bonds, preferred shares and, finally, the ordinary shares.

![Figure 17: Priorities of liquidation in case of issuer's bankruptcy](image-url)

As expected, those instruments that have a higher priority when recovering the funds invested if certain events arise, have a lower level of risk and, thus, lower potential return. This allows managers to take advantage of opportunities in order to achieve significant returns in companies in extreme situations.

Usually, the bet carried out by managers usually consists of taking a long position in those instruments within the capital structure of a company presenting a higher priority when claiming rights in case of default, and a short one in those instruments with a lower priority. For example, if a company in trouble has bonds trading at prices well below par levels and, on the other hand, the shares of the company are at very high levels, the manager will sell short the shares and will buy the bonds, expecting that, due to the bad situation of the company, shares will end up suffering much more than bonds. This strategy is often based on the so-called flight to quality effect that refers to the fact that investors, in certain situations where a company has problems, often move their investments to instruments with higher quality and lower risks. In other words, the strategy is based on the fact that the correlation between instruments with different priorities in payments is low in problematic situations.

However, there are certain managers that, when seeking superior returns, perform the opposite strategy, i.e. they will sell those instruments that have a higher priority in payments in cases where the company presents a default or a bankruptcy, and will buy those instruments that have a lower priority. In this case, the bet of the manager will be based on a high correlation between instruments, i.e. close to one, which is something that not always happen due to the aforementioned flight to quality effect. Obviously, if the correlation is high, the prices of both instruments in an extreme situation of the company should move very similarly, though slightly lower in those with higher priority for recovery, so the loss of the position as a result of the price movement of both instruments will be compensated by the higher yield of those instruments that have a lower priority due to their higher risk.

- **TED spread arbitrage**130: Sometimes, hedge funds seek to exploit opportunities that may arise as a result of changes in existing spreads between the yield of a particular government bond, like the US treasuries, and the interest rates of the Eurodollar contracts, which refer to those deposits denominated in US dollars held in institutions outside the United States. Since the required return to the bonds of a government depends on the creditworthiness of the government, and the interest rate paid by Eurodollar contracts depend on the credit quality of the institutions in which are maintained such deposits, hedge fund managers may bet on a worsening, or an improvement, of the credit quality of governments or banks in order to make a profit.

In a crisis situation, it is quite common that investors move their investments to government debt instead of keeping them in the form of deposits in certain

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financial institutions, due to the lower risk of treasuries. In other words, the TED spread increases, since banks begin to be perceived by investors as less safe, thus forcing them to rise the interest rates paid on Eurodollar deposits, while the returns required to government bonds will be reduced. Therefore, the manager, expecting that the TED spread will increase in the future, will take a long position in government bonds and will sell short Eurodollar futures.

On the other hand, the manager may also perform the opposite bet if he thinks that the TED spread will narrow in the future, but in this case he will buy Eurodollar futures and will sell short government bonds.

- **Long/short credit**: Another common strategy implemented by hedge funds seeking to take advantage of opportunities in fixed income instruments is the strategy known as long/short credit. This strategy is based on the same philosophy as the long/short equity strategy previously analyzed, but in this case the instruments in which the fund invests are fixed income instruments.

First, the manager will conduct a thorough analysis of potential target companies, either belonging to a particular sector, a country, or even to various industries, depending on the investment policy of the fund. However, usually the managers and analysts are specialized in specific sectors. In addition, a fund can also perform this strategy by taking positions in government debt instruments of all kinds.

In this analysis, unlike the analysis conducted in a long/short equity strategy in which special emphasis is put on the income statement (P&L) and on the cash flow statement (CFS), greater attention will be put on the financial situation of the company, as reflected in the balance sheet, and on the CFS, since the most important aspect of the analysis is to know the ability of the company to service its debt, as well as the quality of the assets that can be used as collateral if the company has been unable to meet its contractual obligations. Furthermore, along with these aspects, analysts should also analyze the different covenants included on the debt issued, as they may have a significant impact in the company's operations.

Once the analysis is done, the manager will take long positions in companies that have a high probability of improving their credit quality or to worsen it to a lesser extent, and will sell short companies with high potential of worsening their creditworthiness or to improve it to a lesser extent. This strategy can be

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131 The covenants of a bond refer to the various obligations of the issuer to carry out certain activities, as well as prohibitions. Affirmative covenants are those in which there are defined certain activities which, necessarily, the company must carry out, while negative covenants are prohibitions. Examples include to maintain certain financial ratios above a specified level; to keep dividends at certain levels and even to eliminate them if required; limitations when carrying out large investments that could jeopardize the service of the debt; and even the maintenance of a minimum level of investments in working capital, among others.
performed by trading the fixed income instruments of the target companies directly or even by trading credit default swaps (CDS).

CDS are credit derivatives in which the buyer pays a premium, usually on a quarterly basis, in exchange for protection of the seller of the CDS if certain events that may cause losses to the instrument secured by the buyer arise. If any of the events included in the agreement occurs, the seller will pay a fixed compensation to the buyer or will buy the secured security, which usually means paying to the buyer of the security the par value. Obviously, the price of the CDS will be higher the lower the creditworthiness of a particular issuer or, in other words, the lower are the chances of the issuer to meet its contractual obligations.

If the fund decides to perform the strategy with CDS, the manager will buy CDS (he will be short credit) of those companies who believes that will worsen their creditworthiness or that will improve it to a lesser extent, and will sell CDS (he will be long credit) of those companies that will improve their creditworthiness or that will worsen it to a lesser extent, so that the combined position will report a gain if the relative performance between companies in which the fund is positioned is favorable to its interests.

- **Strategies with STRIPS**: In some cases, hedge funds seek to exploit opportunities that may arise due to differences between the fair value of a given bond and its various components traded separately, provided it can be divided. This type of strategy can be implemented with corporate and government debt instruments, being the latter the most common.

STRIPS (Separate trading of registered interest and principal securities) refers to the process by which a bond is divided into principal and coupons, so that different zero-coupon bonds with a face value equal to each of the coupons and the principal are created. In other words, if a bond maturing in 10 years that pays an annual coupon is divided, it will create 11 bonds, so that 10 of them will have a notional value equal to the coupon and a maturity that will go from one to 10 years, while the last of the bonds will have a notional equal to the principal of the bond that has been divided and a maturity of 10 years. Also, all these zero-coupon bonds, as they have a higher duration compared to comparable bonds that pay a coupon, will have a higher risk for investors and, thus, will be traded at a discount to their par value.

Sometimes, there is a possibility that the components of a given bond can be sold at a fair value greater than the one of the bond, so in these cases the manager will buy a bond at a certain value, to then divide it into its various components. Finally, the manager will sell the different components separately, so that the strategy will report a profit as long as the sum of the proceeds of the sale of the various components of the bond is higher than the price paid for the bond.
The following figure shows an example of this type of arbitrage.

**Figure 18: Example of an arbitrage with STRIPS**

<table>
<thead>
<tr>
<th>Time</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash flows</td>
<td>55</td>
<td>55</td>
<td>55</td>
<td>55</td>
<td>1055</td>
</tr>
<tr>
<td>Net Present Value</td>
<td>52.38</td>
<td>49.89</td>
<td>47.51</td>
<td>45.25</td>
<td>826.62</td>
</tr>
<tr>
<td>Selling price</td>
<td>52.90</td>
<td>50.39</td>
<td>47.99</td>
<td>45.70</td>
<td>834.89</td>
</tr>
</tbody>
</table>


This type of strategy is more common when it involves bonds of a given government with a high credit quality, as there are certain investors who find easier to invest in zero coupon bonds to earn the risk-free return, than doing so in bonds that pay a certain coupon, as the reinvestment of the coupons may pose certain problems sometimes.

The strategy can also be implemented on bonds and bond equivalent components that have been divided. If the fair value of a given bond is lower than that of the components of an equivalent bond that has previously been divided, the manager will sell short those components to then buy the equivalent bond with the proceeds of the short sale, and finally he will divide the equivalent bond into its various components to cover the short position.

Conversely, if the bond has a fair value that is higher than the bond equivalent components, the manager will sell short the bond to then buy the components with the proceeds of the short sale, and finally he will use these components to create an equivalent bond that will be used to cover the short position.

- **Strategies with CDOs**: In recent years, there have been a great number of highly complex new products developed to meet the needs of financial institutions and even of some investors, among which stands out above all the ones known as collateralized debt obligations (CDOs).
A typical CDO is shown in the following figure\textsuperscript{132}.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure19.png}
\caption{Example of a typical CDO}
\label{fig:typical_CDO}
\end{figure}

A CDO is a type of structured product that pays a coupon, provided that the assets that were used as collateral or guarantees in the structuration process of the CDO generate sufficient cash flows to pay this coupon. In addition and, in order to attract investors with different risk profiles, the CDO is divided into different parts or tranches, which are usually senior, mezzanine and first loss/equity, in which more or less coupon will be paid depending on the level of risk of the assets used as collateral, which are the ones that generate all the cash flows needed to pay the coupons of the instruments of each tranche.

Usually, the assets used as collateral are loans granted by financial institutions to their clients, either consumer loans or credit card loans, among others, although in recent years some institutions have also structured CDOs using many other guarantees such as tickets sold by a particular football club, the money generated by royalties of certain artists, and even taxes charged by certain governments, among others. The only requirement that is usually sought in the assets used as collateral is that they must present relatively stable, recurrent and easy-to-predict cash flows.

In this type of product and, like in any financial instrument that exists today, hedge funds have developed various strategies to exploit opportunities that may arise.

The first of these strategies implemented with CDOs is considered the most common one among them, which is none other than to carry out a strategy of

long/short credit, but instead of taking positions in bonds, by using CDOs. The philosophy is exactly the same. Firstly, the manager will perform a thorough analysis to identify opportunities that may arise if the different tranches of a CDO worsen or improve their creditworthiness, so the manager will sell short those tranches that have a high probability of worsening their credit quality more than others or to improve it to a lesser extent, and will buy those showing a high probability of improving their credit quality more than others or worsen it to a lesser extent. Usually, this type of strategy is often implemented with the equity and the mezzanine tranches, which are the ones with the higher yield and the higher risk, as they tend to have a low correlation between them in extreme situations due to the flight to quality effect.

In addition, the manager can also execute a long/short credit strategy by trading CDOs, but in this case assuming that the correlation between the different tranches of the CDO will be high in extreme situations. In this regard, the manager will operate in the different tranches of the same CDO, so he will sell short a lower risk tranche, such as the senior or the mezzanine, and with the proceeds of the short sale will buy a riskier tranche, either mezzanine or first loss/equity. With this strategy, but only as long as there is a high correlation between the different tranches of a CDO in extreme situations, the manager will make a profit, as the fall in the price of both positions should be practically the same due to the high correlation, so the highest coupon received in the long position will be enough to pay the coupon of the short position. However, this strategy is riskier than the above mentioned, because in extreme situations investors tend to move their funds to safer investments and, thus, the correlation is usually quite low or even negative.

The last of the most common strategies employed by hedge funds operating in CDOs is the typical carry trade strategy, in which a given fund asks for funds at low interest rates to then invest these funds in a tranche of a CDO that pays a coupon that is high enough to cope with the cost of financing and to make a profit. This type of strategy is usually carried out in those tranches that pay the highest interest rate, i.e. the equity tranche, although in recent years and, as a result of the very low interest rates prevailing in certain countries, some funds have chosen to be more conservative and have started to invest in the safer tranches.

- **Strategies with TIPS**: Treasury Inflation Protected Securities (TIPS)\(^\text{133}\) are those bonds issued by the US government with a notional that is indexed to the inflation in the country, thereby providing greater protection to investors and carrying a lower risk. In this regard, some managers may seek attractive yields through directional bets based on expectations about the future inflation of the country.

\(^{133}\) Although TIPS are the most known inflation linked bonds, there are also equivalents in certain countries, such as Index-linked GILTS (UK), Bund/ei (Germany) or the OATi (France), among many others. In addition, there are also several indexes and ETFs of inflation-linked bonds.
On one hand, if the manager believes that the expected inflation will be higher than the present inflation, he will buy TIPS and will sell short government bonds that are not linked to inflation, since the yield of the TIPS will be adjusted to that rise in prices, while that of government bonds will be negatively impacted as a result of the higher inflation. In this case, the bet does not depend on the movement of interest rates, as both bonds will be affected equally, but it will be solely based on the behavior of the inflation of the country.

However, if the manager thinks that the expected inflation will be lower than the current, he will sell TIPS and will take a long position in government bonds, so that the combined position will report a profit if the future inflation is below the current.

- **Strategies with MBSs**: As has happened with CDOs, the MBSs industry have experienced a high growth in recent years, particularly in the United States. This has led to the implementation of different strategies by many hedge funds aimed to take advantage of opportunities that may arise in the MBSs market. The functioning of a typical MBS is shown in the following figure.

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**Figure 20: Example of a MBS**

![Diagram of MBS functioning](http://www.raymondjames.com/images/mbs_cmo_1lg.gif)

Mortgage backed securities (MBS) are a type of structured product that pays certain cash flows to investors, but only if the holders of the mortgages used as collateral when structuring the MBS are able to repay their mortgages and to pay interests. In other words, a MBS is structured by using a pool of mortgages of a particular or several financial institutions, so that these mortgages will be responsible to generate the cash used to pay investors with the cash flows generated due to the payments of interests and principal repayments by the holders of the mortgages. This type of product is extremely beneficial for

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134 Source: [http://www.raymondjames.com/images/mbs_cmo_1lg.gif](http://www.raymondjames.com/images/mbs_cmo_1lg.gif)
financial institutions because, on the one hand, allows them to obtain a significant liquidity and, on the other, it reduces the risks that may arise in certain situations of economic crisis, where many customers are unable to cope with mortgage payments.

MBSs may be of various types. First, there are the so called pass through securities, in which investors receive payments (interest and principal) arising from the cash flows generated by a given pool of mortgages granted by one or more financial institutions. In this case, the main risk for investors is that customers have the ability to repay the principal prior to maturity of the mortgage.

On the other hand, there are also CMOs, which have different tranches aimed at investors with different risk profiles and that will pay a higher or a lower coupon depending on the higher or the lower risk of the mortgages used as collateral, whose cash flows will be used to pay investors. In this case and, in contrast to pass through securities, the prepayment risk is distributed among the different tranches.

Finally, there are also STRIPS of MBSs, so there will be an interest only tranche and a principal only tranche. The interest only tranche allows investors to obtain certain cash flows provided that customers are able to pay the interests of their mortgages, while the principal only tranche will provide cash flows to investors only if the clients are able to repay all or part of the principal of their mortgages. Also, it must be said that both tranches will be affected on a positive or negative way depending on whether interest rates rise or fall, so hedge funds usually cover these risks by taking a long position in government bonds of an equal or a similar maturity.

When carrying out strategies with MBSs, the manager will try to analyze if clients will be finally able or not to deal with their mortgage payments to then act accordingly. In other words, the manager will take long positions in those MBSs that pose a high chance to pay their cash flows to investors, while he will sell short those in which the probabilities of default are high.

On the other hand, there are managers who will try to determine the possibilities of the repayment of certain mortgages before maturity as a result of a fall in interest rates, which will be detrimental to the interests of investors as they will be forced to reinvest those funds at lower interest rates; in the same way that there will be other managers who will try to determine the chances of a rise in interest rates, because this will led to a situation where customers will not repay their mortgages in advance and, thus, investors in MBSs will not benefit greatly of the rise on interest rates.

Furthermore, hedge funds may also carry out carry trade strategies by asking for funds at low interest rates, to then invest the funds obtained in MBSs or tranches of CMOs that pay a coupon that is high enough to meet their financing cost.
Finally, it must be said that, in addition to the different fixed income arbitrage strategies analyzed in depth so far, there are other ways to exploit opportunities that may arise in the very different debt instruments existing in the world due to the endless possibilities that allow this type of instruments, many of which are tailor made to meet the needs of customers and investors.\textsuperscript{135}

2.5.6 Convertible bond arbitrage

Convertible bonds are one of the instruments that allow more flexibility to hedge funds when implementing various strategies to achieve higher returns. Moreover, the growth that has been experiencing in recent years the volume of convertible bond issues, has favored the creation of a large number of funds created with the objective of taking advantage of opportunities that may arise in certain issues of convertible bonds.\textsuperscript{136} These instruments are considered as hybrids, as they have characteristics of equities and of fixed income securities, as well as particular aspects that must be known.

A convertible bond is a bond issued by a given company that has an embedded call option of shares of that company, or of other company, the latter being called exchangeable bonds. In other words, these bonds allow investors to convert the face value of the bond into shares of the company, or into shares of other companies, if they decide it, or in the case of mandatory convertible bonds, at maturity.

All convertible bonds will be issued with a given face value, also known as the denomination of the bond, used in the calculation of the coupons according to the interest rate paid by the bond, in the same way as in a conventional bond. It is important to know that the coupon paid by a convertible bond is lower than the coupon paid by other conventional bonds of the same company, due to the fact that investors will get the call option embedded in the convertible bond at zero cost. Usually, convertible bonds pay a specified coupon, although there are times where they do not, in the same way that the conversion could be done also into preference shares.

Also, in any issue of convertible bonds are usually set other important metrics. The first one is known as the conversion ratio, which refers to the number of shares in which that bond can be converted into or, in other words, indicates the multiplier of the call option embedded in the bond. With the conversion ratio, can be calculated the price at which these shares will be obtained by simply calculating the ratio between the face value of the bond and the conversion rate, which will result in the conversion price. In addition, the difference between the current share price and the conversion price is defined as the

\textsuperscript{135} In fact, the vast majority of debt instruments are traded OTC because they are structured, usually by large investment banks, according to the characteristics requested by the customer.


conversion premium, which refers to the increase that should experience the current share price in order to reach the conversion price.

These bonds will behave differently depending on whether their market price is above, below or close to the conversion price, which is nothing but the strike of the call option embedded in the bond. If the price of the shares of the company is above the conversion price, the call option will be in the money and, therefore, the bond will no longer behave as a bond and will have a similar behavior to that of the company's shares, because the investors will end up converting it into shares. If, meanwhile, the price of the shares of the company is below the conversion price, the call option will be out of money and therefore, the bond will behave in a similar manner to other conventional bonds issued by the company, because investors will not convert the bond into shares.

If, on the other hand, the share price and the conversion price stood at similar levels, the bond will behave as a hybrid between the shares and the other bonds of the company. Furthermore, it may happen that the company ends up in a problematic situation. In this case, the convertible bond will behave like a distressed bond, or in other words, it will start to trade at a deep discount to its par value.

The behavior of a convertible bond, which depends of the price of the shares of the company, can be seen in the following figure.

![Figure 21: Behavior of a convertible bond](image)

Regarding the various strategies involving convertible bonds, in general, they tend to exploit opportunities that may arise if the fund is able to purchase cheap call options with the expectation that the share price will behave well enough, so that the bondholder will end up with company's shares at a good price. In this regard, it should be clear that convertible bonds are often seen as instruments in which investors are protected of certain falls, provided that the company that issued the bonds has no problems that could lead to a default or bankruptcy, because the bond will behave, in the worst scenario, as a normal bond. Also, they present an unlimited growth potential due to the call option, so a bet on a convertible bond presents an asymmetry level high enough to justify carrying out an investment. However, it must be said that both the downside protection, as well the unlimited upside, only apply as long as the company is not in a distressed situation.

- **Cash flow arbitrage**: With this strategy, the manager tries to take advantage of the higher interest rate paid by those bonds known as mandatory convertible or exchangeable bonds, in which the investor is required to convert the bond into shares of the company, or into shares of other companies, at maturity. However, if there are no mandatory convertible or exchangeable bonds, the strategy can be implemented with simple convertible or exchangeable bonds. In both cases, the strategy will require a high number of individuals willing to lend shares of the company at a relatively low price.

To implement this strategy, the manager will sell short shares of the company and, with the funds raised by the short sale, he will buy a mandatory convertible bond. This strategy will make a profit as long as the interest rate paid by the mandatory convertible bond in which the manager has taken a long position, is higher than the interest rate paid in the short sale plus the dividend yield of the shares sold short.

- **Volatility trading**: Sometimes, certain managers focus exclusively on the implied volatility paid for the call option embedded in the convertible bond. In other words, they try to buy cheap volatility, to then cover the market risk by shorting company's shares in order to create a position that will make a profit regardless of the movement of the share price.

In this case, managers can perform two types of strategies depending on whether they believe that the realized volatility will be higher than the implied volatility paid when buying the convertible bond or, on the contrary, if they think that the implied volatility will be higher than the realized volatility.

If, on the one hand, the manager thinks that the shares of the company will have a higher volatility than the implied volatility paid for the call option, he will be a premium buyer or, in other words, he will buy the convertible, and thus the option embedded, and will sell short a number of shares equal to the delta of the
convertible, which refers to the percentage of change experienced by the price of the convertible for a given movement in the share price, usually a 1%. This strategy is exactly the same as the one implemented by volatility traders with call options, in which once the call option is bought, they will sell short a number of shares equal to the delta of the option. However, for this strategy to be monetized, the manager needs to perform what is known as gamma trading, which refers to the task of buying or selling more shares depending on how the price of the share moves. This issue occurs because, if the share price goes up, the value of the option and its delta will go up, so if the company's shares rise in price, the manager should be short more shares to fit the position to the new delta, just as if, on the contrary, the price of the shares of the company falls, the manager must buy back shares to adjust the position to the new delta, which will be lower.

The positive aspect of this strategy is that, if the realized volatility exceeds the implied volatility, will not matter if the price of the stock goes up or down since, due to the above mentioned gamma trading, the position will always report a profit. However, for this strategy to succeed, the volatility of the shares of the company must be greater than the implied volatility paid for the call option embedded in the convertible bond, since, otherwise, the combined position will report a loss due to the fall in the value of the call option due to the passage of time. This decline in the value of the option due to the passage of time is measured by the theta of the option.

On the other hand, the manager may think also that the realized volatility will be lower than the implied volatility paid for the option. In this case, he will be a premium seller or, in other words, he will sell short the convertible bond, and thus the call option embedded, and will buy shares of the company for a number equal to the delta of the convertible. This strategy poses the risk that the realized volatility may end up being higher than the implied volatility paid for the option, because every time the manager has to make the process of gamma trading will lose money. However, the strategy will make a profit if the stock volatility ends up being lower than the implied volatility paid, since in this case the seller of the premium will be favored due to the fall in the value of the call option due to the passage of time.

- **Credit arbitrage**: Some managers, usually all those that implement long/short credit strategies, use their knowledge to take advantage of opportunities that may arise in the convertible bond markets as a result of improvements or deteriorations in the creditworthiness of issuers.

In this regard, the manager will take long positions in some convertible bonds if he believes that the issuer will improve its creditworthiness faster, or worsen it to a lesser extent, than others, and will sell short convertible bonds of those issuers with high chances to worsen their creditworthiness faster or to improve it to a lesser extent than others. This strategy can also be performed by using CDS.
In addition, some managers are specialized in special situations and try to take advantage of opportunities that may arise in those issues of convertible bonds where the issuer has serious financial problems. In these cases, the convertible bonds will trade with deep discounts since, on the one hand, the probability of default by the issuer will be high and, on the other, the option will have a value close to zero. This strategy will consist basically in buying convertible bonds of troubled companies at deep discounts, with the expectation that these companies will eventually emerge again.

- **ASCOTs**: There are times where some hedge funds implement strategies through which they try to gain an indirect exposure to the shares of a particular company by using convertible bonds. An Asset Swap Convertible Option Transaction (ASCOT) is a transaction carried out in various parts through which the manager tries to separate the components of a convertible bond to gain an indirect exposure to the shares of a particular company at a low cost, while minimizing risks.

First, the manager will buy a convertible bond that he believes is undervalued to then sell it to another counterparty, which usually is a broker, at a price close to the bond floor or, in other words, with a sharp discount to the price at which he bought it. In return, the broker will sell the manager a call option that will allow him to buy the bond back at a slightly higher price at which he sold it. The following figure shows an example of this transaction.

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**Figure 22: Example of an ASCOT**

![Diagram of an ASCOT transaction](Image)


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\[^{137}\text{Stefanini, F: Investment Strategies of Hedge Funds, Wiley, 2006}\]
This position is really interesting from the point of view of the manager because, if the price of the company's shares rise, he will have the opportunity to participate in that rise due to the option purchased, all without the need for holding the bond and having to deal with the various risks that entails. On the other hand, the worst scenario from the point of view of the manager is the one in which the price of the shares do not end up above the conversion price and, thus, the option will end up out of the money, so the fund will have to take a loss equal to the premium paid for the call option.

On the other side of the transaction, the broker will also have an attractive position because, if the company's shares price do not end up above the conversion price, he will be able to collect the face value of the bond plus the premium received for the sale of the call option, thereby obtaining a profit. Also, if the creditworthiness of the issuer improves, the convertible bond price will increase, which will provide a profit. On the other hand, if the stock price ends up above the conversion price, the hedge fund will exercise the option and will buy back the bond at a price that will be higher than the price paid by the broker for the bond, so he will make a profit too. However, it should be noted that, as a result of buying the convertible bond, the broker must cope with several risks, being the worst case scenario that in which the company defaults or ends up in bankruptcy.

- **Carry trades with convertible bonds**: As happens with fixed income arbitrage strategies, hedge funds can also take advantage of opportunities that may arise in certain situations where they can access to financing at a lower cost than the interest rate paid by certain convertible bonds. In this regard, a manager can get cheap financing in certain countries, such as in Japan, to then invest the funds obtained in convertible bonds with high credit ratings and coupons that exceed the financing cost of the hedge fund. Also, there are companies that have several issues of convertible bonds with different maturities, so that the manager may make a short sale of a convertible bond with a lower maturity and a lower coupon, to then invest the proceeds obtained in the short sale in the purchase of a convertible bond with a longer maturity and a higher coupon. However, in all the cases the fund must take into account the risks assumed in order to hedge the exposures.

### 2.5.7 Global macro

The most famous hedge fund strategy, along with the long/short equity strategy, and probably the most attractive to many investors, is none other than the global macro strategy\(^{138}\), which happens to be the most successful of all the strategies implemented by hedge funds in terms of risk-adjusted returns. This strategy has been chosen by some of the most important figures of the hedge fund industry, such as George Soros or even

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Ray Dalio, the latter being the founder of the world's largest hedge fund, Bridgewater Associates, which currently manages around 150 billion of US dollars in assets.

The global macro strategy is characterized by the flexibility that allows managers when investing, because it uses any type of asset, either equities, fixed income, commodities, currencies or even derivatives, in order to achieve absolute returns in any situation. In addition, the geographical investment universe is total, since hedge funds specializing in a global macro strategy usually carry out investments both in developed and in emerging economies. Using a chess analogy, we can say that the global macro strategy is equivalent to the queen on a chessboard, because it can move in all directions to exploit any opportunity.

When carrying out investments, global macro managers conduct a thorough top-down analysis of the economy or economies in which they intend to make their bets, which will in turn be based on taking advantage of opportunities that may arise as a result of future behavior of the different economic indicators of the country. In other words, global macro managers will try to detect macro inefficiencies, as well as any inconsistencies that may exist in variables such as interest rates; the exchange rate of a certain currency; GDP growth rate; the trade balance; issues related to population and demographics; changes in prices of major raw materials used globally or in specific industries in a given country; as well as in the public deficit, among others.

Once detected the possible inefficiencies that may exist in any of the main economic indicators in a given country, the manager will try to determine the impact that may have on such economic variables some issues of relevant character such as geopolitical events; the fall in the price of several commodities; the global economic situation; fundamental aspects of the country's finances and, ultimately, any external and uncontrollable event by the government that may impact negatively or positively on the economy.

Another important aspect of this strategy is the fact that, unlike the majority of the other strategies implemented by hedge funds, global macro managers usually make directional bets, i.e., taking long or short positions in certain assets depending on whether they think the price of these assets will grow or will fall, but not taking positions in order to fully hedge the risks of their main positions. In other words, global macro managers often do not perform hedges, or at least they do not cover all their exposures. In addition, bets can be conducted by directly investing in certain assets, which is the most common way, as well as by investing in derivatives.
Moreover, this strategy often carries with it a high degree of leverage, since in many cases the economic inefficiencies that may appear in a given economy will allow managers to obtain very small margins than can be amplified by the use of leverage.

In this type of strategy and, as in many other strategies, managers are often reluctant to show their future bets, as these bets are directional, because their interests may be affected negatively if other institutional investors or even certain governments, as a result of knowing in advance the intentions of the hedge fund, take positions that may adversely affect the profitability of the strategy. Therefore, global macro managers usually split their orders between different brokers to prevent that someone may anticipate the bets made. In addition, the main asset of a global macro strategy is none other than the manager himself, since he is the responsible for having a certain macroeconomic view and for taking positions based on his knowledge and way of understanding the world.

Another issue to consider is that relating to the fact that, generally, the vast majority of hedge funds specializing in global macro seek to obtain absolute returns but, in this case, they may also place special emphasis on capital preservation, so that all those hedge funds that specialize in this type of strategy usually have higher assets under management than other hedge funds. In addition, the positions taken by global macro managers tend to be very large, due in part to the high degree of leverage used, and usually are taken only in highly liquid assets such as major currencies, treasuries or major commodities.

In practical terms, some of the bets that can perform global macro managers may be betting on a particular currency devaluation based on the existence of artificially inflated and unsustainable interest rates, as did George Soros and other investors with the GBP in the 1990's; to bet on that a certain currency will appreciate as a result of the rise in interest rates by a given central bank if, for example, a particular country presents very favorable economic data and high growth with low interest rates that could lead to inflation; taking positions in the main equity indexes of a country if future economic prospects are positive; buying government bonds in situations where interest rates are at high levels and the economic situation does not have important fundamental issues; as well as taking positions in any type of commodity in which there are significant differences between its price level and its supply or demand, among others.

As an example, the following chart shows the huge drop in the value of the GBP against the USD in 1992.
Along with all the above bets, global macro managers can also implement what is known as long/short currency strategy, consisting of taking long positions in those currencies that the manager believes that will appreciate in the future, and selling short those other that, as a result of the economic weakness of the country, will depreciate. However, it must be said that, when performing this strategy, it is not enough to analyze in depth the fundamentals of an economy, but also the manager must try to anticipate any possible change in interest rates that may affect the currency, because if interest rates of a country rise, its currency will appreciate as there will be a greater demand for assets denominated in that currency, whereas if interest rates fall, the currency will depreciate, because investors will not be longer interested in assets denominated in that currency.

Finally, it must be noted also that hedge funds specializing in a global macro strategy may carry out carry trades in foreign currencies, consisting in asking for funds at a low interest rate, to then invest those funds in another currency that allows them to obtain a higher return or, in other words, they will buy currencies of those countries where interest rates are at very low levels, to then deposit those funds in term deposits in other countries where interest rates are at a higher level. Obviously, this strategy will report a profit if the interest rate at which hedge funds can invest the funds obtained is higher than the cost of financing.
2.5.8 Distressed securities

This strategy, rather than a strategy itself, refers to implementing any of the strategies previously discussed on certain securities, either fixed income or equity instruments, of companies that present a problematic situation that could give rise to various opportunities for hedge funds. Also, it must be said that there is great competition around the world, mainly due to the large number of venture capital firms and private equity funds that are specialized in this type of strategy.

Obviously, the greatest opportunities in companies with problems often arise in times where the economy of a country, or even the global economy, presents situations of economic stagnation, deceleration, falling activity or crisis. There can also arise opportunities in certain industries as a result of technological innovations that make the products of some companies become obsolete, being this quite common in all the industries of high technological innovation, in which constantly emerge new technologies to replace the previous ones.

In the case of equities, managers specializing in distressed securities tend to focus on companies that pose certain characteristics that make them a potential target, such as the presence of obvious fundamental problems as a result of being unable to cope with the demands of the society or due to technological innovations; obvious financial problems that put the future stability and sustainability of the company at serious risk; companies that were delisted of a given index; firms managed in an inappropriate manner, either because the managers are unable to seize opportunities or that put their personal interests before value creation for shareholders; companies that have been downgraded several times in a relatively short time; shares that are no longer covered by sell side analysts or that have not been covered never, since in this case there may be opportunities that there may not been exploited yet as a result of not being known by the vast majority of investors; firms that pose certain problems with transparency or that are unable to answer questions of investors or regulators on an appropriate manner; firms that have conducted fraudulent or unethical activities recently; companies with a considerable drop in both sales revenue and margins, coupled with a rise in certain costs; firms that are unable to generate enough cash to service their debt; firms that are in situations of liquidation or bankruptcy, as these cases are one of the most attractive due to the high profit potential if the restructuring of the company ensures its future survival; firms unable of generating returns for shareholders higher than their average cost of capital; as well as companies whose bonds pay a higher coupon compared to the ones of other companies operating in the same industry, among others.

The largest bankruptcies in US history, in which several hedge funds took advantage of the situation to achieve impressive returns, are shown in the following table.
It is also noteworthy that this type of strategy\textsuperscript{139} usually has a very high profit potential but, on the other side and, associated with that high potential return, it also poses a very high risk, because if finally a given distressed company in which the hedge fund has invested ends up in bankruptcy, their shares will lose all their value and, therefore, the loss assumed by the fund will be very high. To try to solve this problem, hedge funds that implement distressed securities strategies often conduct a diversification which, in this case, consists in carrying out various investments in distressed securities in order to compensate the losses that may arise in wrong bets with the gains achieved in those positions where the fund was right because, in general, the return achieved in the successful bets is usually very high.

In addition, there will be certain hedge funds that will actively participate in the restructuring of the company, rather than await an outcome, for which they tend to surround themselves with teams specialized in restructurings to help them and to make sure that the restructuring process will end up being positive for the interests of the fund. In this regard, hedge funds act in a very similar way to private equity funds. Furthermore, this strategy will also require extensive knowledge of the relevant

\textsuperscript{139} Gilson, S., Altman, E.: \textit{Creating Value Through Corporate Restructuring: Case Studies in Bankruptcies, Buyouts, and Breakups}, Wiley, 2010
bankruptcy laws applicable to each of the securities in which the hedge fund takes positions.

Finally, it must be said that, among the main risks taken by all those managers that choose to implement any strategy that requires taking positions in distressed securities, are the liquidity risk, as distressed securities are not usually demanded by the vast majority of investors due to the high risks involved, plus the fact that, in certain situations, some laws may prevent any transaction involving these assets during a given period of time; the financial risk inherent to the investment, because there is a high probability that in certain cases the securities purchased may end up losing a significant part or even all of their value; the risk arising of the difficulty of hedging the positions taken in distressed securities, due to the fact that it is difficult to find investors willing to lend this type of securities and, if there are some, they will do it at very high borrow rates; problems when valuing these assets, as they require a high degree of knowledge of both company valuation as well as of some legal aspects; legal risks due to the different laws applicable to a certain security; risks arising of the different priorities in payments between instruments in bankruptcy situations; as well as the fact that a certain restructuring process may not be carried out or may end up being not good enough for the interests of the hedge fund due to not having sufficient voting rights to impose certain ideas.

2.5.9 Emerging markets

As in the case of the strategies with distressed securities, strategies in emerging markets cannot be considered as a strategy itself, but they refer to the implementation of one or several of the strategies discussed so far in emerging markets’ assets, either using equities, bonds, currencies, derivatives or commodities. Also, it must be said that the number of hedge funds that carry out strategies in emerging markets has increased greatly in recent years due to the expansion of the hedge fund industry in certain areas, particularly in Asia, motivated by the opportunities that have arisen in these regions.

Emerging markets refer to all those economies that are making significant progress in economic development but that have not yet reached the levels of economic development of developed economies. In general, such economies tend to have certain common features such as high GDP growth; own currency; problems and little infrastructure development considered as basic in developed economies; large state-owned firms and/or clusters; political instability, as some of them have dictatorships and even authoritarian governments; as well as certain restrictions for foreigners when making investments, particularly in firms belonging to industries considered as strategic, among others.

The following figure shows the countries that are considered as emerging economies.

**Figure 23: Emerging markets**

![Map of Emerging Markets and Frontier Markets](image)

Source: Emerging Markets Funds, HSBC Asset Management

Also the financial markets of emerging markets tend to have common features too, such as the low liquidity of their assets; high market volatility; low level of transparency; the absence in some cases of authorities and regulators aimed to monitor and to regulate financial markets in order to protect the interests of investors; and, ultimately, lower levels of efficiency in pricing than those in the financial markets of developed countries. All these aspects make possible the rise of investment opportunities that can be exploited by those who choose to face the risks.

The investment process of strategies in emerging markets is exactly the same as that applied in any of the strategies discussed so far, except that in this case, the manager must place special emphasis on the evaluation of the possible scenarios that may occur in the short, medium and long term. In addition, and as it happens with the strategies in distressed securities, to cover possible risks, hedge funds often limit the amount of funds invested in emerging countries, in the same way that they try to carry out bets in emerging countries whose economies are affected differently by certain events or that are in different stages of the economic cycle. Furthermore, and due to the high volatility that these markets tend to have, hedge funds employ a great number of technical analysis tools, such as stop or time orders, to avoid large losses.
In the case of debt instruments, it must be highlighted the fact that certain hedge funds held investments in bonds issued by companies or by governments of emerging countries denominated in local currency, although in recent years these countries have also conducted issues of instruments denominated in safer currencies, such as US dollars, to attract more international investors. In the case of investments carried out in bonds denominated in local currency, the analysis should be deep, and it should take into account different future scenarios that may occur in the economy in which the fund has invested, as well as the impact of these scenarios in interest rates. Obviously, these bonds pose a higher risk, so the coupons paid are very high compared to those paid by bonds of developed economies, which has led to a large number of carry trades carried out by certain hedge funds due to the low funding costs that exist in certain developed economies.

On the other hand, the number of activist hedge funds operating in emerging markets has been experiencing a high growth in recent years, due to the little international experience and even lack of knowledge of some management teams of large national companies, that have tried to take advantage of opportunities through the implementation of various strategies aimed to internationalize such national companies to increase their profitability and the value creation for shareholders.

Finally, it must be noted also that the main risks of making investments in emerging economies are the lower liquidity of assets in those countries; the possibility of expropriation by the government; the contagion that may occur in the event that a given emerging economy begin to face problems due to the shared features of such economies; the limited protection for investors due to the lack of legislation and regulatory authorities; political risks, since many of these economies often have significant instability; as well as the difficulties faced by some hedge funds specializing exclusively in making investments in emerging economies, not only because of the difficulty of predicting any crisis in these countries, but also by the contagion effect that usually occurs once an emerging country starts having problems, among others.

2.5.10 Managed futures

As it was mentioned when the Investment Advisers Act of 1940 was analyzed, certain hedge funds offer managed futures accounts to customers that invest a minimum volume of assets, which generally tends to be quite high. These managed accounts are aimed to customers who want to take advantage of opportunities that may arise in the futures or options markets, but that do not have enough time nor sufficient knowledge of those markets, so to exploit these opportunities they can hire a hedge fund to be in charge of the implementation of several strategies in futures markets.
The first aspect of this strategy\textsuperscript{141} is that, usually, hedge funds can invest in futures or options contracts on any type of asset, such as equities, fixed income, currencies, interest rates or commodities. If the hedge fund invests in commodities, which is quite common, it must be registered as a CTA, defined as any individual or firm that provides advisory services when conducting transactions in futures, forward contracts or options on commodities; or as a CPO, defined as any individual or firm that receives funds in order to be invested in futures or options on commodities of all kinds. The following figure shows the main differences between the different managed futures strategies implemented by hedge funds.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure24.png}
\caption{Differences between managed futures strategies}
\end{figure}

Operationally speaking, this strategy implies that the hedge fund, first, needs to develop a highly complex proprietary automated trading system aimed at analyzing the potential opportunities that may appear in the futures’ global markets, although at times the investment universe may be restricted to certain areas. These systems will be defined to carry out investment decisions if certain parameters entered by the system developer are met, so the importance of fundamental analysis at the time of making decisions is usually left in a second place to put special emphasis on technical analysis. However, it must be said that, in some cases, managers have flexibility when deciding the entries and exits of some positions.

The main objective of the system is to maximize the returns, while assuming minimum risks, as well as keeping transaction costs at the lowest level. In general, the structure of

\textsuperscript{141} Greyserman, A., Kaminski, K.: \textit{Trend Following with Managed Futures: The Search for Crisis Alpha}, Wiley, 2014

these trading systems usually have certain common characteristics, as they all tend to have an alpha model, also known as the strategy, which is responsible to determine the timing and size of the positions in order to generate absolute returns; a risk model, which is responsible to limit the size of the positions to make sure that they are suitable to generate high and sustained returns over time; a transactions costs model in charge of calculating the costs of the orders introduced by the system; a portfolio construction model, which is the one that builds the appropriate portfolio according to all the data provided by the alpha, risk and transactions costs models; as well as an execution model responsible for executing the necessary operations to construct the portfolio without a trace that may be used by other competing systems in order to anticipate the future strategy of the fund, which would greatly reduce the returns obtained.

Obviously, all those hedge funds that have such systems, either because they have been developed internally or because they have been bought to external developers, need a highly expensive technology infrastructure, so these strategies are often developed only by hedge funds that have a high volume of assets under management. In addition, these systems typically operate throughout the day, so operating costs will also be quite high.

On the other hand, it must be said that, in general, these systems are often divided between those aimed to identify trends in order to take advantage of opportunities that may arise due to the continuation of that trend, and those aimed to predict the end of a certain trend aimed to exploit potential opportunities that may occur once the trend has come to an end. In addition, some systems operate in very small time horizons or, in other words, with the minimum latency, as in the case of High Speed Trading (HST) systems, while others will have a time horizon of one day as maximum in order to avoid having open positions at market close, such as High Frequency Trading (HFT) systems, which seek to obtain positive returns by carrying out a high number of not too large operations in which margins are very small.

Finally, the main risks of this strategy will be aspects such as risk of modeling or model risk, which means that the strategy may be unable to predict the future and, thus, to generate positive returns, either because the model is inapplicable due to the introduction of incorrect assumptions or due to the use of improper methods, because the model is not well specified, i.e. the model is not able to correctly describe the real world, or maybe because it has implementation errors either in its software or in its hardware; risks relating to structural changes, because certain structural events may make that some assets begin to behave differently than they did it in the past, thus making the system no longer effective to predict the future; risks of external shocks, such as terrorist attacks, wars, changes in weather, legal reforms or politic changes, among others, that may introduce new information to the market that the system may be unable to process; the possibility that the strategy will be copied by the competition, which may end up eventually causing the system being unable to generate positive
returns; as well as the risks of contagion that may cause the fall in the price of certain assets as a result of investor panic due to any unpredictable event.

2.5.11 Funds of hedge funds\textsuperscript{142}

On occasion, some funds are not specialized in the implementation of one or more of the various strategies discussed so far, but in the selection of those hedge funds that are more successful when implementing each of these strategies. In other words, these funds of hedge funds invest the money of their investors in other hedge funds that are the ones responsible for generating returns through some of the many strategies that can be put into practice.

The following list shows the top 10 funds of hedge funds (FoHFs) as of 2014 by assets under management.

\begin{table}
\begin{center}
\begin{tabular}{|l|c|c|}
\hline
Manager & Location & Assets under Management \\
\hline
Blackstone Alternative Asset Management & US & $61.0 \text{bn as at 30 June 2014}$ \\
A&Q Hedge Fund Solutions (UBS) & US & $31.0 \text{bn as at 1 July 2014}$ \\
Grosvenor Capital Management & US & $25.7 \text{bn as at 30 June 2014}$ \\
HSBC Alternative Investments & UK & $25.2 \text{bn as at 30 June 2014}$ \\
GSAM & US & $25.0 \text{bn as at 31 December 2013}$ \\
Pernam Group & US & $22.3 \text{bn as at 30 June 2014}$ \\
BlackRock Alternative Advisors & US & $19.9 \text{bn as at 30 June 2014}$ \\
Westrow Advanced Strategies & US & $13.8 \text{bn as at 30 June 2014}$ \\
Morgan Stanley Alternative Investment Partners & US & $12.8 \text{bn as at 30 June 2014}$ \\
J.P. Morgan Alternative Asset Management & US & $11.3 \text{bn as at 30 June 2014}$ \\
\hline
\end{tabular}
\end{center}
\end{table}

Source: The Preqin Quarterly Update: Hedge Funds, Q3 2014

The main problem of these funds of hedge funds is none other than trying to select the best hedge funds among the many that exist in the world. To do this, they conduct a costly and thorough due diligence process through which they try to know in detail all the features of the hedge fund analyzed, to then decide to invest or not in the strategy of the fund. This due diligence process is critical, since recent studies concluded that “operational due diligence is an important source of alpha in hedge fund investment (Brown, Fraser & Liang, 2008)”. This strategy will achieve a profit as long as the strategies implemented by hedge funds in which the fund of funds invests are able to achieve positive returns.

\textsuperscript{142} Nicholas, J.: \textit{Hedge funds of funds: An investor’s guide}, Bloomberg Press, 2004
Among the main aspects analyzed in the due diligence process are the education, career path, and the remuneration of the fund managers in order to know whether they are sufficiently trained to carry out certain strategies or not; the track record of the managers and the strategy, to assess the returns achieved in recent years; the existence of clauses that may force managers to invest part of their wealth in the strategy, to know whether there is an alignment of interest between fund managers and investors or not; the number of employees of the hedge fund, with special emphasis in people employed in the area of analysis; the operational structure of the fund, with the aim of trying to learn more about its operational efficiency; the level of assets under management; the major clients of the fund, including aspects such as how long they have been invested in the fund, as well as the money invested; the profile of the clients of the fund; aspects related to the strategy or strategies implemented by the fund, such as objectives, both in terms of returns and risk, restrictions, type of strategy, investment process, portfolio construction, estimated maximum capacity of the portfolio or asset allocation, among others; fee structure; clauses relating to fund redemptions and subscriptions; as well as risk management procedures, among others.

The main advantages for investors who choose to invest in funds of hedge funds are diversification, as they allow to avoid the problems that may arise if a strategy does not work at certain times or even if some of the hedge funds in which it has invested present problems, although some studies concluded that “funds of funds concentrate rather than dissipate tail risk exposure (Brown & Spitzer, 2006)” due diligence, because it is the fund of funds the one that assesses the suitability of hedge funds through a due diligence process that is practically impossible to carry out by an individual investor; risk management, which is carried out in a professional and active manner; as well as the possibility that they offer to certain investors to invest in strategies of certain hedge funds in which they can’t invest directly due to the high investment requirements, as these requirements are usually much lower in the case of funds of hedge funds, among others.

On the other hand, the main disadvantages of investing in funds of hedge funds are the additional costs of carrying out such investments, since funds of hedge funds have to cope with the fees charged by hedge funds in which they invest and, then, investors have to deal with the fees charged by the fund of hedge funds, which are often a performance fee of 10% and a management fee of 1.5%, although sometimes they can be higher; the little control that have investors when investing in certain strategies and funds; as well as the lesser transparency, as hedge funds only provide information to the fund of funds and not to investors. Regarding to the higher fees paid by investors of FoHF, it must be said that recent studies concluded that “the more diversified the fund is, the greater the likelihood that the investor will incur an incentive fee regardless of overall fund performance (Brown, Goetzmann & Liang, 2004)”.

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2.5.12 Other strategies

In addition to the strategies discussed so far, which are the most known and used within the hedge fund industry, there are others, many of which have been developed over recent years, that are implemented by some hedge funds seeking to differentiate from the major funds of the industry. Among these strategies\textsuperscript{144}, are the following:

- **Holding company arbitrage**: In certain situations, opportunities may appear in holding companies whose shares are exchanged at a NAV that is lower or higher than the sum of the values of the different companies belonging to that holding. In other words, if the market capitalization of the holding is different of the sum of the market capitalizations of the companies that conform the holding, arbitrage opportunities will appear. If the NAV of the holding is lower, the manager will take a long position in shares of the holding company and will sell short the shares of each of the components of that holding, so he will make a profit if the spread narrows.

  On the other hand, if the NAV of the holding company is higher than the sum of the values of the components of the holding, the manager will sell short shares of the holding company and will buy shares of the companies that make up the holding. The main risk of this strategy is that if, for any reason, the spread between the NAV of the holding company and the value of the components of this holding widens, the manager will face a loss.

- **Closed-end funds**: This case is similar to the mentioned above. In cases where the NAV of a given fund closed to new investments is different than the value of the positions taken by the fund, arbitrage opportunities will appear. These opportunities will be exploited in the same way as in the previous case.

- **ETF arbitrage**: An ETF refers to an open ended investment fund, i.e. accepting money of new investors, which is traded in a stock exchange. As in the previous cases, there may be arbitrage opportunities if there are differences between the NAV of the ETF and the sum of the values of the securities held by the fund. If the NAV of the ETF is above the value of the components of the fund, the manager will sell short shares of the ETF and will buy shares of its components, while if it is below, the manager will buy shares of the ETF and will sell shares of its components.

  However, this strategy is usually carried out by the so-called authorized participants, which are financial institutions responsible for creating and amortizing new units of the fund, in order to provide greater liquidity to the ETF and, consequently, make it more attractive to investors. In this case, if the NAV of each of the units of the ETF is above the sum of the values of its components, the authorized participant will buy such securities in the market to deliver them

\textsuperscript{144} Stefanini, F: Investment Strategies of Hedge Funds, Wiley, 2006
to the sponsor of the ETF in exchange for a new unit of the ETF that, later, will be sold on the market to make a profit. Similarly, if the NAV of the units of the ETF is below the sum of the values of its components, the authorized participant will buy the unit to deliver it to the sponsor of the ETF in order to amortize it and receive the components that, later, will be sold on the market in order to pocket a profit.

An example of the operative used by authorized participants in this strategy is shown below.

Figure 25: Operative used by authorized participants in an ETF arbitrage strategy

Source: Compiled by author based on information from morningstareurope.com

- **Index arbitrage**: On certain occasions, usually due to the ease of investing in certain indexes through futures, arbitrage opportunities may appear due to the existence of differences between the fair value of a given future on an index and the sum of the values of the various components of the index. If a future is trading above its fair value, the manager will sell short the future and will buy shares of its components.

On the other hand, if the future is trading below its fair value, the manager will buy the future and will sell short shares of the components of the index. In both cases, the strategy will make a profit as long as the spread between the future's price and its components narrows. In addition, it must be said that the manager can also place a bet based on an expectation of a widening of the spread.

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• **Strategies with special derivatives**¹⁴⁶: Certain hedge funds seek to exploit opportunities that may appear in certain complex products. Some of these products are weather derivatives, which are aimed to cover risks that may arise as a result of an unusual behavior of the weather; insurance contracts on weather, which are aimed to cover risks arising of possible unusual atmospheric phenomena; as well as catastrophe bonds, which pay a high coupon and repay the principal, provided that certain disasters defined by the bond issuer do not occur in the future. Given the extreme difficulty of trying to predict not only the weather, but also the occurrence of certain disasters, these strategies pose very high risks, as well as unpredictable returns.

• **ADRs/GDRs arbitrage**: American depositary receipts (ADR) are certificates representing shares of foreign companies that are kept in a depository bank, listed in the various stock exchanges of the United States and denominated in USD. On the other hand, if such representative titles are issued in several countries, will be known as global depositary receipts (GDR). As in the cases analyzed above, if a given ADR or GDR trades at a different price than the foreign shares, arbitrage opportunities may arise. Operationally speaking, if an ADR or GDR is trading at a higher price than the shares of the foreign company it represents, the manager will sell short the ADR or GDR and will buy foreign stocks, provided that there is no limitation to do it. Conversely, if an ADR or GDR trades at a lower price level than the shares of the foreign company it represents, the manager will buy the ADR or GDR and will sell short the foreign shares.

• **Venue arbitrage**: Certain hedge funds specialize in taking advantage of arbitrage opportunities that may arise in dual listed stocks, which are shares that are listed in several stock exchanges of the world, if the prices of the shares in two stock exchanges are different. In this case, the manager will buy the shares in the stock exchange in which those shares have the lower price to then sell them in the stock exchange in which the shares have the higher price. Obviously, when implementing this strategy, the manager also has to consider some other aspects such as the exchange rate, as well as the transaction costs, among others.

• **Statistical arbitrage**: With this strategy, hedge funds seek to exploit opportunities that may arise as a result of inefficiencies in the prices of certain financial assets. First, the manager will try to calculate the fair value of a certain instrument, so if there are differences between the quoted price and the fair price of the instrument, arbitrage opportunities may appear. This strategy will make a profit as long as the price ends up reverting to its fair value, which is something that does not always happen. Usually, this strategy is carried out by using complex mathematical models and automated trading systems that analyze

numerous assets and markets around the world, so it requires high expertise and advanced technology\textsuperscript{147}.

- **Volatility trading**: Some hedge funds are specialized in strategies that seek to take advantage of opportunities that may arise in certain derivative products such as options or swaps, among others. In the case of options, hedge funds tend to bet that the realized volatility will be lower or higher than the implied volatility paid for the option, so if the manager believes that the realized volatility will be higher than the implicit volatility, he will be a premium buyer; while if the manager believes that the realized volatility will be lower than the implied volatility, he will be a premium seller\textsuperscript{148}.

Along with the aspect mentioned above, the manager must cover the risks of the strategy by taking long or short positions, as applicable, in shares of the underlying, as well as to carry out the gamma trading. In addition, these type of bets can also be carried out through instruments such as variance or volatility swaps, or even with futures on volatility indexes. On the other hand, it must be said that hedge funds specializing in financial options often conduct various strategies specifically designed for these instruments, among which are those known as bull or bear spread, butterflies, straddle or strangle, among others.

- **Investments in commodities**: Certain hedge funds are specialized in commodities, thereby seeking to take advantage of opportunities that may arise in the markets of the major commodities of the world, such as precious metals, base metals, soft commodities\textsuperscript{149}, oil, coal, natural gas, electricity or wood, among others.

- **IPOs lock ups**: Once a company goes public, there is a lock-up period during which investors that invested in the IPO cannot sell the shares. However, when the lock-up period expires, there is usually a large number of investors that decide to sell some of the shares acquired in the initial public offering in order to monetize part of their profits. This often have a negative impact on the price of the shares, due to the fact that the number of shares sold is usually high. This is why some hedge funds tend to sell short shares of these companies shortly before the expiry of the lock-up period with the aim of making a profit derived of the probable fall in the share price.


\textsuperscript{149} The main soft commodities are coffee, sugar, cocoa, wheat, orange juice, cotton, wool, cattle or soybeans, among others.
• **Split-strike conversion/collar**\(^{150}\): In the context of the various strategies that can be implemented with financial options, a split-strike conversion, also known as a collar, consists of a purchase of a put option and a sale of a call option, both with the same maturity and underlying but, however, with different strikes. This type of conversion is often used by hedge funds in a strategy that consists in buying a basket of stocks, which usually tend to be the major companies of a particular index, as well as a split-strike conversion. With this strategy, the manager will have limited upside in the event that the price of the basket of stocks rises above the strike of the call option, as well as downside protection in the event that the price of the basket of stocks falls below the strike of the put option.

An example of a split-strike conversion is shown in the following figure.

![Figure 26: Example of a split-strike conversion](image)

Source: Compiled by author based on information from CB O.E.com

• **Investments in private equity**: Some hedge funds also seek to exploit opportunities arising in private companies, in a similar way to venture capital or private equity funds. In these cases, the hedge fund performs an analysis of the company that is very similar to the analysis conducted in listed companies, only that in the vast majority of cases, the fund actively participates in the management of the private company in order to maximize the returns obtained.

• **Direct lending**: Although it is not their usual business, some hedge funds often use the fact that certain companies have problems when obtaining funding in order to achieve additional returns. In this case, certain hedge funds choose to

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grant direct loans, usually at high interest rates, to those companies that have difficulties to obtain financing. Obviously, this strategy carries the risk that these companies eventually may be unable to meet the payment of interests and repayment of principal. To avoid this problem, sometimes these operations are carried out in the form of loans that can be converted into shares of the company, so the hedge fund may gain some control of the company in the event that the firm has been unable to repay the loan requested.

- **PIPEs (Private investments in public equity)**\(^{151}\): In some cases, certain hedge funds make investments in companies with problems to obtain funding only that, in this case, not through direct loans with the ability to be converted into shares of the company, but by investing directly in public companies that offer new shares, or convertible bonds, only to a small number of private investors, with a certain discount compared to the market price of the ordinary shares of the company.

  In this case, the legislation to be considered by hedge funds is the Regulation D, which includes an exemption for registration for this type of private placements. The positive aspect of this strategy lies in the fact that hedge funds can buy shares of a particular company at a lower price compared to the market price of such shares, so that returns may be high if the share price behaves in an acceptable manner. However, they must also face some risks, being the most important the one relative to liquidity, as Regulation D prohibits the sale of shares offered to private investors for a period of two years, unless they have been registered over the following six months after such placement; as well as the possibility that the company may end up in bankruptcy.

- **Investments in real estate**: Some hedge funds also try to take advantage of opportunities that arise in the real estate market through direct investments in times when the price of real estate has suffered significant declines. After some time, they sell those properties if there has been a rise in prices. Also, they may rent those properties to generate recurring cash that may be used to carry out other investments.

Finally, it must be said also that there are certain multi-strategy hedge funds that implement a combination of several of the strategies discussed in this chapter but, usually, these funds are only those with a volume of assets under management high enough to employ several teams specialized in various strategies. However, it must be said that many hedge funds that carry out several strategies are composed of various compartments, each intended to implement a particular strategy, although it may be the case that there is a vehicle operated by a team of managers and analysts specialized in

multi-strategy. However and, in this regard, it must be said that some studies concluded that “competition among hedge funds in the same category (strategy) greatly increases the liquidation probability of an individual hedge fund in that category and, as a result, hedge fund managers might choose to stay in the category which experiences favorable positioning and less competition (Getmansky, 2012)”.
2.6 RISKS

Like any investment, hedge funds pose a considerable number of risks that must be taken into account by all those investors who are planning to invest in this type of investment vehicles. Among these risks are the following:

- **Market risk**: Market risk is considered one of the most important risks to consider by investors when making investments of all kinds. This risk refers to the possibility of having losses as a result of movements in the prices of the assets in which the hedge fund carries out investments. This risk is also called systematic risk, because it is a type of risk that cannot be completely eliminated, so the only way to minimize it is by hedging the exposures. In this regard, it must be said that recent studies concluded that “knowing a fund’s exposures to common market risk factors is useful to fund managers and investors, since that information helps investors in designing hedge fund portfolios, managing risks, setting suitable performance benchmarks, and detecting inconsistent bets by managers (Fung & Hsieh, 2004)”.

  This risk is usually measured by the volatility, which is defined as the annualized standard deviation of historical returns, as well as by other metrics such as Value at risk (VaR), which refers to the maximum loss expected at a given time horizon and for a given level of confidence; or Conditional VaR (CVarR), which refers to the probability, given a certain confidence, that the loss of a specific asset or portfolio exceeds the VaR, among others.

Within the market risk is included the equity risk, which refers to the possibility of having a loss in an investment in equities as a result of movements in the stock prices.

Another risk included within the market risk is the interest rate risk, which refers to the possibility of having a loss due to movements in interest rates that may affect prices of certain assets. In this regard, the assets more affected by movements in interest rates are usually fixed income securities, as well as all those derivatives whose underlying is a fixed income security, although equity markets are also affected to some extent by movements in interest rates. On the other hand, it must be said that the sensitivity of fixed income instruments to certain movements in interest rates will be higher or lower depending on the characteristics of the security, such as maturity, coupon, or even the environment of interest rates existing in the country.

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Horwitz, R.: *Hedge fund risk fundamentals: Solving the risk management and transparency challenge*, Bloomberg Press, 2004
Also is included within the market risk the possibility of suffering losses due to movements in exchange rates between currencies. In this regard, investors should be aware of aspects such as the monetary policy implemented by a given central bank, as well as by the supply and demand of the currency in the foreign exchange market. This type of risk is usually hedged by companies by using derivatives products, being the most common ones forward contracts, although sometimes are also used futures or options on currencies.

The last of the risks included within the market risk refers to the possibility that an investor may suffer a loss in a particular investment as a result of adverse changes to his interests in the prices of commodities. This risk is harder to hedge than the others, as each commodity is affected differently by a large number of factors, so it is necessary to consider the different scenarios that may occur in the future in order to carry out actions aimed to minimize risk.

- **Credit risk:** Credit risk is another of the major risks faced by investors. This risk is defined as the possibility that a particular investor may suffer losses derived of the failure of one of his counterparties to meet the assumed contractual obligations between the parties.

  This risk is usually measured by rating agencies, which are institutions responsible for giving credit ratings to all the companies evaluated according to their creditworthiness though, however, there have been cases where the rating agencies have failed when giving ratings, as happened during the international financial crisis that began in 2007, which led to a large number of investors to take substantial losses in many of their investments.

  When trying to minimize credit risk, hedge funds often conduct a thorough analysis of the creditworthiness of issuers, in which they carry out investments with the aim of determining whether such issuers are sufficiently solvents to meet the payment of interests and repayment of the principal of their loans and debt issues, or not. In addition, and along with this analysis, hedge funds employ certain derivative products such as CDS, and they also require additional collateral to issuers in order to protect themselves of the possibility that a given counterparty is unable to meet its contractual obligations. Finally, it must be noted also that the credit risk can be minimized by diversification.

  Within the credit risk, it is included the so-called default risk, which refers to the potential losses that may occur if a particular borrower or issuer of bonds or debentures is unable to pay to its investors the interest or return the principal of its instruments issued or loans received.

  Another aspect included in credit risk is the sovereign risk, which refers to the possibility of having to take a loss if a government defaults on its debt issued. In other words, this risk refers to the possibility that some nations may be unable to service their debt, either payment of interest or repayment of principal. This type
of risk emerges in situations in which a country presents serious economic or political instability, or even in crisis affecting several countries.

This risk is usually monitored by investors by analyzing the evolution of the CDS\textsuperscript{153} of the major debt-issuing countries of the world, so the higher the CDS of a country, the greater will be the risk of default of the country. The following table shows some of the most important sovereign defaults of the last decades.

<table>
<thead>
<tr>
<th>Year</th>
<th>Country</th>
<th>Total Defiulted Debt (S millions)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>November 1998</td>
<td>Pakistan</td>
<td>$1.627</td>
<td>Pakistan missed an interest payment but cured the default subsequently within the grace period (within four days). Shortly thereafter, it defaulted again and resolved that default via a distressed exchange, which was completed in 1999.</td>
</tr>
<tr>
<td>August 1998</td>
<td>Russia</td>
<td>$72.709</td>
<td>Missed payments first on local currency Treasury obligations. Later a debt service moratorium was extended to foreign currency obligations issued in Russia but mostly held by foreign investors. Subsequently, failed to pay principal on MTN/DO foreign currency bonds. Debts were restructured in August 1999 and February 2000.</td>
</tr>
<tr>
<td>September 1998</td>
<td>Ukraine</td>
<td>$1.271</td>
<td>Moratorium on debt service for bearer bonds owned by anonymous entities. Only those entities willing to identify themselves and convert to local currency accounts were eligible for debt repayments, which amounted to a distressed exchange.</td>
</tr>
<tr>
<td>August 1999</td>
<td>Ecuador</td>
<td>$6.604</td>
<td>Missed payment was followed by a distressed exchange, over 90 percent of bonds were restructured.</td>
</tr>
<tr>
<td>September 2000</td>
<td>Peru</td>
<td>$4.870</td>
<td>Peru missed payment on its Brady Bonds but subsequently paid approximately $30 million in interest payments to cure the default within a 30-day period.</td>
</tr>
<tr>
<td>January 2000</td>
<td>Ukraine</td>
<td>$1.064</td>
<td>Defaulted on DM-denominated Eurobonds in February 2000 and defaulted on USD-denominated bonds in January 2000. Offered to exchange bonds with longer term and lower coupon. The conversion was accepted by a majority of bondholders.</td>
</tr>
<tr>
<td>November 2001</td>
<td>Argentina</td>
<td>$82.268</td>
<td>Declared it would miss payment on foreign debt in November 2001. Actual payment missed on January 3, 2002. Debt was restored through a distressed exchange offering where the bondholders received haircuts at approximately 70 percent.</td>
</tr>
<tr>
<td>April 2003</td>
<td>Uruguay</td>
<td>$3.744</td>
<td>Contagion from Argentina debt crisis on 2001 led to currency crisis in Uruguay. To restore debt sustainability, Uruguay completed a distressed exchange with bondholders that led to extension of maturity by five years.</td>
</tr>
<tr>
<td>April 2006</td>
<td>Dominican Republic</td>
<td>$1.622</td>
<td>After several grace period defaults (missed payments cured within the grace period), the country executed an exchange offer in which old bonds were swapped for new bonds with a five-year maturity extension, but the same coupon and principal.</td>
</tr>
</tbody>
</table>


\textsuperscript{153} You can access to a list of the sovereign CDS at the following link: https://www.dbresearch.com/servlet/reweb2.ReWEB?rwnode=DBR_INTERNET_EN-PRODSEM&rwobj=CDS.calias&rwsite=DBR_INTERNET_en-PROD
The last of the main risks included in credit risk is the settlement risk, which refers to the possibility of having to take losses if one of the counterparties of a transaction does not deliver the asset by which the other counterparty has paid a certain amount of money or, seen from the other side of the transaction, if the investor does not receive any money in exchange for the asset delivered.

- **Liquidity risk:** Liquidity risk refers to the possibility of incurring losses due to the difficulty of carrying out purchases or sales of certain assets. In other words, liquidity risk emerges in situations where there are not enough buyers or sellers willing to trade a certain asset. However, it must be said that this risk is not usually common in the major indexes, currencies, commodities or even equity or debt instruments of the world, as these assets often have a very high liquidity. In this regard, it must be said that recent studies concluded that “the effect of liquidity risk was very weak for some non-equity (like fixed income arbitrage or multi-strategy) hedge funds and for market neutral hedge funds (Gibson & Wang, 2010)”.

This risk is important to all those hedge funds that carry out strategies on distressed securities, as these assets often have a much lower liquidity than others due to the high risks associated to them. This often leads to a situation where investors may face the risk of having to unwind their positions at prices that may not be the most attractive for their interests and, consequently, having to take a loss in the investment.

In this regard, all those investors who decide to make investments in hedge funds must consider the lower liquidity of these instruments, as both subscriptions and redemptions of fund units may only be carried out in certain dates, usually monthly, quarterly or even annually in some cases, and must be noticed in advance.

Finally, it must be noted that the best way to minimize liquidity risk is by setting maximum limits when making investments in distressed securities, as well as by diversification.

- **Idiosyncratic risk:** Idiosyncratic risk, also known as specific risk, is the opposite of the market or systematic risk. In other words, the correlation between idiosyncratic risk and market risk is very small and sometimes may be even zero, as this risk refers to the possibility of having to take losses due to various aspects affecting only to the asset or assets in which the fund has invested. In other words, this risk refers to the likelihood of suffering losses if the price of certain assets falls due to specific aspects of such assets.

It also must be noted that the idiosyncratic risk has an unpredictable character, but can be mitigated by diversification. In this regard, hedge funds often conduct scenario analysis before carrying out investments, whose main objective is to
know in advance the impact that may have different future scenarios in the returns achieved.

- **Operational risk**: Operational risk is defined as the possibility of having to take losses as a result of having inadequate or failed internal processes, systems or employees, as well as due to various external events that may impact negatively in the operations of the hedge fund. This risk is generally lower in those hedge funds that have automated much of their processes because, in these cases, human errors are less common. However, it must be said that recent studies have found “a significant positive interaction between operational risk and financial risk, which suggests that funds with high operational risk are more subject to failure from excessive financial risk than are funds with low operational risk (Brown, Goetzmann, Liang & Schwarz, 2009)”.

Some of the aspects included in the operational risk are the likelihood that some employees may conduct fraudulent, illegal, unethical or inappropriate activities; inadequate protection of privacy and of the interests of customers; as well as any human error that may occur in the normal course of activities carried out by the fund.

When trying to minimize this risk, hedge funds tend to promote continuous training of their employees, as well as the implementation of various mechanisms and procedures aimed to identify, measure, track, monitor and, wherever possible, to mitigate potential risks that may arise.

The typical risk management process is shown below.

**Figure 27: Typical risk management process**

![Risk Management Diagram](image-url)
• **Model risk:** Model risk\textsuperscript{154} refers to the potential losses that may arise as a result of using erroneous or incorrect models when making investment decisions. This risk is not unusual because, generally, any model used for the valuation of assets such as equities, fixed income, derivatives or commodities, usually includes a great number of assumptions that may not be fulfilled in reality.

The risk of modeling arises from different aspects such as the inapplicability of the model, which is the possibility that the assumptions or methods used in it may be wrong; misspecification of the model, as it can be specified in a way in which it is not able to describe correctly the real world; as well as due to various implementation errors that may exist in the model, either in the software itself, or in the hardware used.

Finally, it must be noted also that, when minimizing this risk, hedge funds try to make investment decisions based on data obtained from different valuation methods and models to, then, carry out different sensitivity and scenario analysis aimed to assess and to evaluate the performance of the assets analyzed in different situations that may occur in the future.

• **Business risk:** Business risk refers to the possibility of suffering losses due to various unpredictable events that may have a negative impact on the business developed by the hedge fund. Usually, these different events can be internal or external, and refer to aspects such as changes in the culture of investors; loss of key employees that may leave the fund to join competitors; natural disasters that may affect the ordinary course of the business; changes in legislation that may impact to the efficiency and returns achieved by the fund; strikes due to employee dissatisfaction; as well as the emergence of new technologies or systems developed by competitors that may negatively impact the competitiveness of the fund, among others.

Within this risk is included the so called risk of short-squeeze, which refers to the possibility of suffering a loss in situations where a large number of investors who sold short a certain stock are forced to cover their short positions as a result of a sudden rise in price, or even due to an event that would suggest a significant future improvement of the stock.

Furthermore, within the business risk is included the so-called financing squeeze, which refers to the possibility of having to take losses as a result of the difficulty of the hedge fund to obtain financing, either to perform daily activities, or to implement various strategies such as short selling or using leverage.

Another risk included within the business risk is the legal risk, which refers to the possibility of assuming losses arising from changes in the existing

\textsuperscript{154}Narang, R.: *Inside the black box: A simple guide to quantitative and high-frequency trading.* Wiley, 2013
legislation, as well as due to incorrect interpretations of laws, contracts and regulations applicable to certain activities and transactions carried out.

Also, included within the business risk is the compliance risk, which refers to the possibility of having to take certain losses due to having to deal with possible legal sanctions, fines or even major financial losses arising from non-compliance with laws, rules, regulations or codes of conduct.

The last of the main risks included within the business risk is the reputational risk, which refers to the possibility of having to take losses as a result of a damage to the reputation of a particular hedge fund that may have a direct impact on the fund's ability to maintain a minimum level of competitiveness and to assure its future sustainability within the industry. These damages to the reputation of a hedge fund are usually caused due to unethical behaviors, frauds, deceptions and ultimately, any action that may be perceived as harmful or incorrect by investors.

- **Country risk:** Country risk refers to the possibility of having to take losses in investments in a given country as a result of problems that may arise in the country, among which are aspects such as political instability; changes in the monetary policy implemented by the Central Bank; situation and/or future economic prospects of the country; wars or conflicts within the country; amendments to existing legislation and, ultimately, any political or economic event that may affect the valuation of the assets in that country. The following figure shows the different countries of the world according to their level of risk.

![Figure 28: Countries according to their level of risk](image-url)

Source: “Country risk premia quarterly update”, PWC
It must be noted also that, when trying to minimize the country risk, the most effective way to do it is by diversification or, in other words, by investing in different countries that are affected differently by certain geopolitical events, as well as by investing in countries which are at different stages of the economic cycle.

- **Concentration risk:** Concentration risk\(^{155}\) refers to the possibility of suffering large losses as a result of having made significant investments in a small number of issuers or in a particular industry. In this regard, the concentration risk arises as a consequence of not having done enough diversification, so the best way to minimize this risk is to establish maximum limits for investments in certain issuers, sectors or industries. In other words, the concentration risk is reduced by diversification.

Finally, it must be said that this risk is very important, because if a particular issuer, or a particular sector or industry, in which a hedge fund carries out many of its investments has problems that could eventually result in a default or in a bankruptcy, losses will be very high due to the concentration of investments in such issuer, sector or industry.

3. UCITS

3.1 DEFINITION

3.1.1 Definition

The “Undertakings for Collective Investment in Transferable Securities”, commonly known as UCITS, are investment funds established in the European Union and authorized under a harmonized legal framework that allows that any UCITS that has been registered in the European Union and that has been authorized by this legal framework, may be sold not only in the country in which it has been registered and authorized, but also in any other country of the European Union, without the need for additional requirements.

The possibility of UCITS, once have been registered in a country of the European Union, to be sold in any other EU country, is usually known within the industry of mutual funds as an European passport, and it is fundamental to this type of investment vehicles, because it greatly increases their efficiency and reduces costs, as well as it prevents that all those individuals who decided to market a UCITS need to register different individual vehicles in each of the different countries, all of them with different laws and regulations. Furthermore, it is noteworthy that there are certain countries outside the EU that also allow the distribution of UCITS to retail investors, due to the strict regulatory regime in which this type of investment vehicles operate, as well as because UCITS have been away of a great number of scandals occurred in the financial world in the past years, in which hedge funds have had a particularly notorious importance.

Since their introduction several decades ago, UCITS have grown largely due to its attractive features, which are aimed at satisfying the interests of the vast majority of retail investors who, usually, often do not have sufficient funds or high risk profile to carry out investments in hedge funds. In fact, the growth of UCITS funds has been so overwhelming in recent years that currently represent around three quarters of all the investments made by retail investors in the European Union in mutual funds, as stated by the European Commission\(^\text{156}\).

3.1.2 Characteristics

UCITS funds have certain features\(^\text{157}\) that make them different to hedge funds, beyond that both are collective investment vehicles and that, on occasion, some of the strategies

\(^{156}\) http://ec.europa.eu/finance/investment/ucits-directive/index_en.htm

implemented by both are similar. Among the main characteristics of UCITS there are the following:

- **Highly regulated:** UCITS are subject to a harmonized regulatory framework in the European Union that is strict enough to ensure the interests of all investors who have decided to make investments in this type of investment vehicles. Among the main aspects to be taken into account by investors, are the fact that the legislation currently requires UCITS to carry out a proper diversification of their investments, as well as the obligation that the assets of the UCITS shall be maintained in a custodian that must be independent to the fund.

  The strict regulations applicable to UCITS, which will be examined in more detail in the section on the historical evolution of this type of product, contrasts with the little existing regulation applicable to the hedge fund industry, which is an aspect that has been seen by many investors as an important attraction when deciding to invest in UCITS funds rather than in hedge funds.

- **Open-ended:** Another important characteristic of UCITS is the fact that they are open-end funds, i.e., they accept a very high number of investors or, in other words, they have the ability to issue new shares and to redeem shares anytime they wish. This makes that any investor that decides to buy or sell shares of the fund may do it directly with the sponsor or with other investors.

  However, and regardless that UCITS are open-end funds, it must be said that the fund may be closed to new investors, and even to new investments by existing investors of the fund, if it reaches a level of assets under management that may complicate the achievement of the objectives of the fund.

  On the other hand, the vast majority of hedge funds tend to have limited the maximum number of investors in order to take advantage of certain exemptions and thereby to achieve greater efficiency that may enable them to obtain comparative advantages compared to traditional mutual funds. Also, the maximum capacity of assets under management of certain strategies of hedge funds is usually much more limited than in the case of UCITS.

- **European passport:** Another aspect that characterizes UCITS funds is the fact that, once a given fund is authorized to operate and to distribute its units in one of the member states, the fund will also be allowed to be distributed in all the countries of the European Union. This aspect, which is called European passport, greatly increases the efficiency of UCITS funds, as it prevents funds having to register on each of the countries in which they intend to operate and to distribute their units, which greatly reduces costs.

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• **Professionally managed**: UCITS funds are actively or passively managed by professional managers who, in the majority of cases, have a great experience in the field of asset management, or at least, in areas related to finance or investment banking. This aspect is very positive for the vast majority of investors, particularly for retail, that do not have sufficient financial knowledge or even the time necessary to carry out investments by themselves.

Within the professional management, there are issues such as the implementation of mechanisms and procedures for managing risks that are aimed to limit potential losses; carrying out the management of the fund according to certain parameters that collect the desires of investors; the use of advanced investment techniques that generally require a high knowledge of financial management aspects; as well as the application of advanced portfolio construction techniques in order to achieve the objectives of the fund, among others.

Furthermore, it must be noted that when making investment decisions, managers of UCITS funds and, like in the case of hedge funds, carry out a deep analysis of the issuers and of the assets, as well as of the existing economic conditions and possible future expectations, with the aim of selecting those assets that will behave better in the future. Also and, along with the analysis conducted, they often carry out sensitivity and scenario analysis that are aimed to know in advance how certain assets would behave if certain scenarios occur in the future.

• **Diversification**: Like any other collective investment vehicle, UCITS allow investors to minimize credit risk when investing their money, due to the significant diversification of the investments made by this type of funds.

This feature, which is also present in hedge funds, is even more relevant in the case of UCITS since, as will be seen later, this type of investment vehicles have a great number of limitations to carry out their investments that are aimed to protect the interests of all investors who have decided to make investments in these products. This aspect is not usual in the case of hedge funds, as they usually do not have any limitation when carrying out certain investments or even to concentrate investments in certain securities, sectors or industries, if so is decided by the portfolio manager.

On the other hand, it must be emphasized that the diversification can be made by investing in different types of assets, industries, sectors, or even countries, so that managers will take positions in those assets with the better future prospects.

• **Targeted to all investors**: Another important aspect to consider of UCITS is the fact that the profile of the investor base of all of them is very heterogeneous or, in other words, they are targeted to an investor base that consists of retail and/or institutional investors, as well as of high net worth individuals. In addition, the investment requirements are relatively affordable for the vast majority of the
investors of the European Union, being this an important aspect to explain their great success in recent years.

Also, the fact that UCITS funds are targeted to an extremely large investor base, contrast to the limited number of investors that can undertake investments in hedge funds, either because they require to be an accredited investor or very high investment requirements that are not affordable for many investors.

Another important issue to consider when analyzing UCITS is that many of these funds are aimed to capital preservation, so that in these cases, both the expected returns and risks assumed, will be lower than in other cases. This type of funds aimed to investors who put special emphasis on capital preservation, are extremely successful within the private banks of a large number of existing financial institutions across the European Union because, usually, the vast majority of private banking clients have built their fortune by inheritance, either monetary or in the form of shares in companies, and therefore, their main objective is to maintain the fortune so that their relatives may access to it in the future.

On the other hand, UCITS funds are usually managed according to different investment styles, so that investors can decide in which fund to invest according to their personal tastes. In this regard, there will be specialized funds investing in value companies, which are often mature companies with a strong competitive position within the industry in which they operate, and others that will focus on taking advantage of investment opportunities that may appear on high-growth companies that also pose a higher risk due to their future uncertainty.

- **Special fee structure:** UCITS funds usually have different costs that have to be taken into account by all those investors who choose to make investments in them. On the one hand, they charge a fixed management fee, which varies depending on the fund and, on the other hand, investors will have to pay a performance fee in those cases where the fund has been able to beat a predefined index or a hurdle rate. Along with these costs, UCITS can also charge additional costs such as a custody fee, amortization or subscription fees, among others.

However, and although the cost structure of UCITS and hedge funds may have common features, it must be said that both the management fee and the performance fee of UCITS are much lower than the ones charged by hedge funds. This aspect is usually explained by the fact that a large number of UCITS are aimed to replicate the returns achieved by a given index or basket of securities, so that the value added in these cases is very limited and, consequently, the fees charged by the fund to investors have to be low because, otherwise, many of these investors will end up buying a particular ETF that also replicates the performance of an index or a basket of securities but, in this case, at a much lower price.
The following figure shows the performance fee that is usually charged to institutional and retail share classes by UCITS.

**Figure 29: Performance fees usually charged to institutional and retail share classes by UCITS**

- **High liquidity**: One of the most important advantages of UCITS is the fact that investors have the ability to buy and sell units in a very simple way. Usually, the vast majority of UCITS have daily or weekly liquidity, so investors may undo their positions in a very small time period in those cases in which they need to recover the funds invested. In addition, all listed UCITS can be bought and sold by anyone in any moment, just as securities that are traded in the major stock exchanges of the world. In this regard, it must be said that recent studies concluded that “UCITS hedge funds have more favorable liquidity terms than hedge funds and that, when compared liquidity matched groups of UCITS hedge funds and hedge funds, their performance seems to converge (Joenväärä & Kosowski, 2013)”.

This aspect contrasts with the low liquidity which tend to have hedge funds, since the vast majority of this type of investment vehicles have monthly, quarterly and, in some cases, annual liquidity. Moreover, along with the lower liquidity, hedge funds present the equally important fact that all investors who wish to unwind their positions must notify it in advance, and it may be some cases in which hedge funds may impose a maximum limit of funds amortized in a certain period of amortization.
**Limited flexibility**: UCITS funds must be managed according to certain regulations laid down in the applicable legislation that, usually, often impose certain limits and restrictions to managers.

Within these regulations, the legislation impose maximum and minimum limits to the investments made in certain assets; a minimum level of diversification aimed to avoid problems that may arise if a certain investment does not behave well; restrictions in the maximum level of leverage that can be used by managers when implementing certain strategies; limitations in the use of short selling; restrictions when taking certain derivative positions, particularly those exhibiting a more complex character; as well as the obligation to implement management mechanisms designed to achieve sustained positive returns over time while minimizing risks and costs, among others.

Particularly relevant is the fact that, unlike hedge funds, UCITS are not entitled to sell short physical instruments, either equity or fixed income securities, but nevertheless those UCITS funds that are sophisticated can enter into certain derivatives transactions, such as equity swaps, that allow them to get the same effect that these short sales.

In this regard, it must be noted that the flexibility of UCITS is very limited compared to the overall flexibility of hedge funds to use different techniques and to implement strategies to maximize the returns obtained. However, it must be said that the lower flexibility of UCITS is aimed at protecting the interests of investors at all times, as well as to avoid the implementation of an aggressive and reckless management exclusively intended to maximize the returns achieved at all costs.

On the other hand, and due in part to the more limited flexibility of UCITS, it must be noted that this type of investment vehicles pose some risks, measured by their volatility, that are usually lower than those of hedge funds, although in certain situations UCITS can have high losses, as happened in the international financial crisis that began in 2007.

**Diversity of legal structures**: Although there is a harmonized regulatory framework in the European Union applicable to all UCITS authorized and registered within it, it must be noted that the legal structures of each of the funds may vary depending on the country in which has been approved and registered. Some examples of these legal structures that can be used when structuring a UCITS fund are SICAVs, open-ended investment companies (UK) or variable capital investment companies “VCC” (Ireland), among others.

In addition, there are also some special structures such as umbrella structures, funds of funds, as well as master/feeder structures, that are also allowed, provided that certain characteristics are met by both the master fund, as by the feeders.
In this regard, UCITS funds have a large number of alternatives that enhance their operational efficiency and thereby achieve competitive advantages that can lead to a better service provided to all investors who have decided to invest in them.

Examples of a typical self-managed, as well as of a non-self-managed, variable capital investment company are shown in the following figure.

Figure 30: Examples of a self-managed and non-self-managed variable capital investment company

- **High transparency**: The last of the main characteristics of UCITS funds is the fact that they have a very high level of transparency, as investors have access at all times to all information concerning the fund that they require. Again, the high transparency required to this type of funds by existing regulations has as its main objective to protect the interests of investors, as well as to avoid unethical behaviors, frauds or deceptions.

In this regard, UCITS funds are much more accessible to the vast majority of investors than hedge funds, which are extremely secretive in order to prevent other competitor funds to know the strategies implemented in advance and to take positions that may reduce the returns achieved.
3.2 HISTORICAL EVOLUTION


UCITS funds have their origins in 1985, when the European Parliament approved the Directive 85/611/EEC\textsuperscript{159}, also known as UCITS I, with the objective of harmonizing the laws applicable to existing collective investment institutions in different countries of the European Union; the various controls and obligations imposed by each country to all those individuals that desired to establish a specific fund; as well as all these differences between countries that largely distorted competition.

The following table summarizes the main aspects introduced by the Directive.

\begin{center}
\begin{tabular}{|c|c|c|c|c|}
\hline
\textbf{European passport (UCITS funds may be distributed in all EU countries once registered)} & \textbf{Definition of funds that are not considered as UCITS} & \textbf{Definition of the obligations of management companies and custodians} & \textbf{Definition of the obligations and restrictions applicable to UCITS funds when making investments} & \textbf{Definition of the obligations of management companies when distributing information of the fund to investors} & \textbf{Definition of the supervisory authorities of UCITS} & \textbf{Definition of other obligations of UCITS} \\
\hline
\end{tabular}
\end{center}

\textit{Source: Compiled by author based on Directive 85/611/EEC of 1985}

This allowed not only that all those authorized funds registered in a country of the European Union could be distributed in all other EU countries, but also to increase the effectiveness in protecting all those investors that decided to carry out investments in this type of investment vehicles. It also introduced a great number of basic common rules in which a number of mandatory criteria were established by all member states on issues related to the authorization, registration, monitoring, permitted activities, as well as to the distribution of information by all these funds to investors.

\textsuperscript{159} You can access to an electronic version of this Directive through the website of the ESMA (European Securities and Markets Authority) at the following link: \url{http://www.esma.europa.eu/system/files/Dir_85_611.PDF}
Furthermore, the Directive also defined different types of funds that could not be considered under the harmonized legal framework introduced, within which were closed UCITS, and even those UCITS funds whose shares were not intended to be distributed to investors based in member countries of the European Union, among others. Also, for all these funds that were not included in the Directive, each country could have a specific law aimed to protect and to guarantee the interests of their investors.

The Directive also defined different aspects and obligations concerning the structures of all UCITS funds. On the one hand, the fund management company should focus exclusively on its management, just as it should have sufficient financial resources to carry out its daily activities effectively and to cope with its responsibilities. In addition and, as mentioned above, the custodian of the fund units must be registered in the same state of the European Union in which has been authorized and registered the management company, and must be independent of that management company, thereby ensuring compliance with the law and with the rules of the fund in order to protect the interests of investors. In addition, the custodian shall be an institution supervised by the financial supervisory authority of the member state in which it is registered.

Also, member states would have the power to not require any custodian to all those management companies that choose to distribute the units of the funds managed through one or more stock exchanges. However, in these cases, these management companies have a number of additional obligations aimed to protect the interests of its investors, such as to provide them all the different methodologies applied to the calculation of the NAV of their shares; to trade in the open market to prevent that those shares may be traded at a price that differs greatly from their NAV, particularly in those situations where the price of the shares is a 1% above or below the NAV; certain NAV publication requirements relating to the distribution of it to investors and to the competent authorities; as well as the obligation of calculating the NAV periodically by an independent auditor, in order to ensure transparency and to avoid possible misconducts, deceits or frauds, among others.

In terms of investment policy and the various strategies that could be implemented by UCITS funds, the Directive also established various obligations to all of them.

First, there were certain restrictions when investing in certain assets, in order to avoid that such funds may undertake investments in risky assets that may endanger the interests of investors. In this regard, UCITS could only invest in those securities traded in the major stock exchanges of the different states of the European Union, as well as in those stock exchanges belonging to non-member countries, but as long as these stock exchanges were regulated and open to the public.
In addition, it also allowed UCITS to make investments in those recently issued securities not traded in a major stock exchange, provided that in their issuance were included certain actions to be performed by the issuer in order to achieve the listing of the securities in the near future, and only if the issuance was guaranteed for a period of at least 1 year.

Furthermore, the Directive also imposed several limits to UCITS when making investments, which detracted some flexibility to this type of funds compared to hedge funds. Within these limits, were included the following, among others:

- A UCITS fund can't hold investments in excess of a 10% of its assets under management in instruments that are not traded in any of the major stock exchanges of the world. Usually, the main requirement to be met by such assets is to have a high level of liquidity.

- To ensure proper diversification and to avoid that investor protection may be eroded by concentration risk, a UCITS fund can't hold investments in excess of a 5% of its assets under management in assets of the same issuer although, on occasion, member states could increase this limit to a 10%, but as long as the value of the investments in those issuers in which the fund has invested more than a 5% of its assets does not exceed the 40% of the fund's assets or the 35% if so decided it a particular member state.

- Any member state of the European Union could allow a UCITS to carry out investments of at most a 10% of its assets under management in all those debt instruments that present similar characteristics to the equity instruments traded on a stock exchange. In this regard, those debt instruments should be very liquid and must have a value relatively simple to calculate at any time. In addition, member states must first define what type of fixed income instruments could be included within this category.

- UCITS funds are entitled to invest all of their assets under management in those assets that are guaranteed by any member state or by its local authorities, as well as by any other state not belonging to the European Union or by international organizations in which one of the member countries of the European Union participate. In this regard, a UCITS is obliged to invest in at least six different issues, but provided that no more than a 30% of its assets under management are invested in one issuer.

- A management company responsible for managing a UCITS fund will have to deal with certain obligations, aimed to prevent it from buying shares with a sufficient number of voting rights that may allow such management company to influence the decisions of the management team of the issuer of such securities.
• A UCITS fund may acquire any type of fixed assets, including real estate, but as long as there are necessary to carry out its daily activities.

• In general terms, a UCITS fund or a management company shall not borrow, although in some cases a member state may authorize temporarily borrowing, particularly in those situations where additional funds are required to purchase properties required to carry out the ordinary activities of the fund, but as long as the value of these loans is not greater than the 10% of assets under management of the fund.

• At no moment, a UCITS fund is allowed to carry out naked short sales.

• UCITS funds are not entitled to invest in precious metals or in certificates representing such materials.

• A UCITS fund can't hold investments in excess of a 5% of its assets under management in other funds that are not under the harmonized regulatory framework of the Directive.

• Member States of the European Union are responsible for authorizing UCITS funds to use different asset management techniques aimed at increasing management efficiency and ensuring proper implementation of actions that would allow achieving the objectives defined by the fund.

Furthermore, the Directive also defined a great number of obligations to all those UCITS's management companies when distributing all the relevant information concerning the fund among investors. The main documents that should be made available to investors were the following:

• A prospectus of the fund in which all the relevant information required must be included, so that investors may undertake investment decisions wisely. All this information should be presented clearly and accurately, by using a language easily understood by the vast majority of investors.

The brochure must be updated at all times, and it must also include aspects relating to the different mechanisms used by the fund when making investments, as well as the rules of the fund. Furthermore, it should detail the remuneration of the management company, as well as the mechanisms used for the calculation of such remuneration.

• An annual report composed of a balance sheet, in which all the information concerning the assets and liabilities of the fund at the end of the period is included; an income statement, in which the income and expenses of the fund during the period are detailed; as well as of several additional reports in which
the various activities carried out by the fund over the period, as long as there are relevant for making investment decisions, are included.

In addition, the annual report of the fund shall be audited by an independent auditor to ensure a certain level of transparency and to make sure that such financial statements have been prepared following the accounting principles applicable in the right way. This report conducted by the auditor must be included in the annual report, so that investors can access to it at all times.

Both documents, as well as all modifications, shall be made available to the competent authorities, as well as to all investors who request them for free. In this regard, the fund’s investors must periodically receive both documents, included any amendments, while all those potential investors of the fund must be able to access to the relevant information through various ways defined, usually in the prospectus, by the fund.

On the other hand, and along with the above information, UCITS funds must also publish the price of issue, sale, amortization or buyback of their shares at the time of such actions or, at least, twice a month, unless a member state allows the fund to carry it out monthly, but as long as this does not have a negative impact on the interests of investors.

Another important aspect to consider of UCITS is the fact that they must comply with the existing legislation in member states of the European Union in which there are distributed, particularly in all those aspects that are not covered by the Directive.

Similarly, UCITS must adapt themselves to the legislation responsible for regulating advertising of this type of products in the country. In addition, any fund that choose to distribute its units in countries other than that in which it has been approved and registered, at first, must notify the appropriate authorities of each of these countries, and make available to all of them all the relevant information of the fund before it can be distributed to investors. Once done and, as long as there is no impediment by the country in which the fund is to be distributed, it can begin to be distributed from the two months following such communication.

In the event that a given fund has received authorization of one member state to distribute its units among investors resident in that country, it shall make available to all investors who request it all the relevant information written in one of the official national languages.

Also, it must be noted that the vast majority of UCITS that are distributed in different countries of the European Union often use the same name in all countries, although in
some cases, they may be forced to change the name used in order to avoid confusion with other entities with similar names within the country.

Finally and, concerning the supervision of all UCITS, it must be noted also that the Directive states that the authorities responsible for overseeing this type of investment vehicles must be public authorities or, in some cases, institutions designated by public authorities. Moreover, all these authorities shall cooperate to ensure that supervision at supranational level is carried out effectively, to ensure that the interests of all investors, regardless of where they are located, are guaranteed and protected.

However, it is noteworthy that, in this regard, only the authorities responsible for overseeing the countries in which it has been distributed a given fund will be authorized to take any action against a particular fund that violated the law or that breached its own rules.

Along with the above mentioned aspect and, in the event that a particular fund lost the authorization to be distributed in a given country, the authority responsible for supervision in that country will be the one that must transmit to the authorities of the other countries in which the fund is distributed the actions taken.

3.2.2 First steps towards greater flexibility

The importance of the Directive 85/611/EEC of 1985 for the collective investment industry was huge, as it allowed an impressive growth motivated largely by the investor protection that the Directive introduced. However, it still presented several restrictions that limited greatly the flexibility of this type of investment vehicles, particularly when compared with hedge funds, which possessed full flexibility to implement new and complex strategies aimed to achieve absolute returns. This aspect led to the introduction of various amendments designed to modify certain aspects of the Directive in order to provide UCITS with new mechanisms that enabled them to cope with the demands of some investors.

The following table shows the first UCITS funds established in the EU.

\footnote{You can access to a list of the Competent Authorities of the different member states of the European Union at the following link: http://www.esma.europa.eu/page/Prospectuses-and-supplements}
The first of the amendments was the Directive 88/220/EEC of 1988\textsuperscript{161}, which introduced the possibility that those UCITS that desired it, could carry out investments of up to a 25\% of their assets under management in certain bonds issued by credit institutions registered in any of the member states, provided that such credit institutions were supervised by a public authority to ensure the interests of bondholders. Furthermore, those UCITS that invested in bonds of a single issuer in excess of a 5\% of their assets under management, could accumulate such investments to the maximum limit of an 80\% of their assets under management.

The Directive also introduced a new article that required that all the funds collected from the bonds issued must be intended for the purchase of assets that could be used to meet the obligations of the bonds, either repayment of principal or accrued interest, in those cases in which a particular issuer is unable to meet its contractual obligations.

The second of the amendments was introduced by the Directive 95/26/EC of 1995\textsuperscript{162}, which included aspects aimed to strengthen the supervision of all the existing UCITS.

\textsuperscript{161} You can access to a digital version of this Directive through the website of the ESMA at the following link: http://www.esma.europa.eu/system/files/Dir_88_220.PDF

\textsuperscript{162} Digitally available at the following link: http://www.esma.europa.eu/system/files/Dir_95_26.PDF
funds. In this regard, the main aim of the Directive was to strengthen the stability and integrity of the European financial system, as well as to promote the exchange of relevant information between the competent supervisory authorities, in order to collaborate and to improve the detection of activities contrary to law that could be performed by certain funds.

Among the main reforms contained in this Directive, was the adoption of various measures aimed to increase the efficiency of the supervision carried out by the competent authorities of each of the member countries of the European Union for those cases in which there were significant links between the management company of a fund, or the fund itself, and any other person, either individual or legal. In this regard, important links were defined as situations in which there was a relationship in which one party had control over the other or a stake of at least a 20% of its voting rights.

Furthermore, in cases where there were important links, the competent supervisory authority may deny the authorization of a UCITS to be distributed in the country, provided such links may impede an effective oversight of the entity or verifications aimed to protect the interests of the fund's investors.

On the other hand, the Directive also granted the possibility to the competent supervisory authorities of the different countries of the European Union, to exchange information with other supervisory authorities in cases where a certain authority is responsible for overseeing the liquidation of assets of a given fund. This information will be treated as confidential and may not be distributed without the agreement of all those authorities who have been involved in these processes.

Similarly, it also allowed the supervisory authorities to transmit such information to certain public or private bodies such as central banks, other monetary authorities, clearing houses, as well as to other public authorities in charge of overseeing systems of payments.

Along with all the above aspects and, for those cases in which a given UCITS is in bankruptcy, the supervisory authorities also have the ability to share information with third countries, provided it is guaranteed that the information shared will be treated as confidential, that may be used to perform the tasks assigned to such authorities in the most professional manner. The information received could be used, among other things, to assess the different mechanisms of internal control of the fund, accounting procedures, or even to define sanctions.
The third of the amendments introduced after the approval of the Directive 85/611/EEC of 1985, was the Directive 2000/64/EC of 2000\textsuperscript{163}, which followed the line traced by the abovementioned Directive 95/26/EC of 1995, and that introduced new amendments relating to the exchange of information between the various supervisory authorities in the European Union and even also with third countries.

In this regard, the Directive permitted the different member states of the European Union to establish cooperation agreements with third countries through which the exchange of information was allowed, provided that the confidentiality of such information was respected and that it will be used exclusively by the competent supervisory authorities to carry out the necessary tasks.

However, since the introduction of the Directive 85/611/EEC in 1985, still were needed new amendments aimed at increasing the flexibility of UCITS funds, and even to improve the supervision of such investment vehicles by the supervisory authorities, because the reforms introduced lacked of sufficient importance to allow such funds to compete in terms of flexibility with hedge funds, so that seemed essential to carry out a major reform, which took place in 2002.

However, a few years before, the different member countries of the European Union tried to reach agreements to introduce amendments that would have been known as UCITS II, although in this case and, due to the important differences between the various member countries, the reforms were abandoned due to the inability to reach any agreement.

3.2.3 The introduction of UCITS III

The first substantial change following the adoption of the Directive 85/611/EEC of 1985 occurred in 2002, when there were introduced, on the one hand, the Directive 2001/107/EC, commonly known as the Management Directive and, on the other hand, the Directive 2001/108/EC, usually known as the Product Directive. These two directives are known as "UCITS III" or "Newcits" and, so far, are one of the most important agreements reached between member states of the European Union in terms of harmonized rules applicable to undertakings for collective investments.

The following chart shows the importance, as well as the impressive impact, of both directives in the UCITS fund industry since their introduction.

\textsuperscript{163} You can access to a digital version of the Directive through the following link: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32000L0064
3.2.3.1 Directive 2001/107/EC or Management Directive

The Directive 2001/107/EC\(^{164}\) of 2002, also known as the Management Directive, brought many innovations applicable to all those UCITS’s management companies that were operating in the European Union. The main aspects introduced by the Management Directive are summarized in the following table.

| Table 21: Management Directive  
Main aspects introduced by the Directive |
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<td>All management companies must obtain an authorization to operate in the EU</td>
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First, the Directive defined that management companies should obtain authorization to manage money from investors by the competent authorities of the member state in

\(^{164}\) Digitally available on the website of the ESMA through the following link: http://www.esma.europa.eu/system/files/Dir_01_107.PDF
which they decide to start their operations. This authorization, once obtained, will be accepted in all the member states of the European Union, so that the directive eliminated the need to obtain authorization in each country in which a management company chooses to operate. Furthermore, management companies should be devoted exclusively to the management of UCITS funds and, on occasion, to manage other funds, although in these cases the funds won't be distributed under the same conditions applicable to UCITS.

However, in certain cases, member states may allow some management companies to carry out investment services relating to activities such as portfolio management following the customer's desired mandate, and even the provision of financial advice or services of custody and administration to certain funds, but only if the management company is principally engaged in fund management.

Along with this, the Directive also contains a number of essential characteristics that a management company shall present to obtain authorization, among which are the following:

- A management company must have an initial capital of at least 125,000 euros, although in those cases where the management company has assets under management of over 250 million euros, it has the obligation to provide additional capital equal to the 0.02% of the amount above the 250 million euros. However, the maximum capital requirement for management companies may not exceed 10 million euros.

- Managers must be sufficiently well trained to perform the complex task of managing the funds of investors according to the strategy defined by the fund, as well as they should be able to prove a minimum level of experience and reputation in the field of asset management. In this regard, a management company shall be managed by at least two individuals who meet these characteristics.

- The management company shall have its headquarters, or a registered office, in the same member state of the European Union than the UCITS.

- Competent authorities should receive information regarding the major shareholders of the management company, including the names of these shareholders and even the volume of the funds contributed by each of them.

- In cases in which there are important links between a management company and others, either individual or legal persons, the competent authorities may deny the authorization provided that such links may prevent the effective supervision of the institution.
Once a particular management company receives authorization of the competent authorities of a member state of the European Union, it shall periodically provide any information that is required by the relevant supervisory authority. In addition, an authorization may be revoked in certain cases. Some of these cases are that the management company has not exercised this authorization during the year following the grant; it has obtained authorization by using false information; it has waived the authorization; it breaches the conditions required to maintain the authorization; it continually violates various of the provisions contained in the Directive; or that it is within some assumptions in which the applicable national law of a member state withdraws the authorization, among others.

Furthermore, the Directive also defines a series of conditions to be considered by management companies when carrying out their operations. In this regard, the management company must have accounting mechanisms, administrative procedures, data protection and internal control mechanisms, that minimize the risks and that ensure the interests of investors. In addition, all those management companies that have been authorized to operate in any member state of the European Union, shall comply with different codes of conduct drawn up by the member state, in which different principles are included such as acting fairly and honest, and always seeking the best choice for investors; operating with integrity and diligently to favor their clients; using all the necessary resources and procedures to ensure the correct conduct of its activities; as well as addressing all compliance requirements required by the relevant authorities, among others.

Another aspect to consider is the fact that, as mentioned earlier, a management company that obtains an authorization to operate in one member state, may be established and provide all the services for which it has been authorized in any of the member states of the European Union. To this end and, in the event that a management company decides to open an office in a different country than its home member state, it shall notify its desire to start operations to the competent authorities of that country, and has to make available to these authorities all the information concerning various aspects such as operations intended to be carried out; the operational structure chosen; its address; as well as the name of the responsible for the office that will be opened.

On the other hand, the member states in which a particular management company has decided to start operations may also request other relevant information in order to monitor its activities and to protect the interests of domestic investors. In addition, and, in those cases where a member state has detected that a particular management company does not comply with existing legislation of the country, it may contact the authorities responsible for the supervision of the company in its country of origin to inform them on the irregular situation. Then, the authorities of the country of origin will contact the management company and will instruct it on the various actions that must be taken to comply with the law. If the management company does not perform the
required actions, the supervisory authorities of the state in which the company does not comply with existing legislation may withdraw the authorization to operate in the country and to distribute its funds among domestic investors.

Furthermore, the Directive also imposes a number of conditions to be met by investment companies, provided they do not have any assigned management company, in order to receive an authorization to operate within the borders of the European Union, within which are included the following:

- The initial capital of the investment company must be at least 300,000 euros.
- An application for authorization shall include information concerning the organizational structure of the investment company.
- All the important links that may exist between the investment company and other persons, either individual or legal, should be detailed, so that in those cases where the supervisory authority determines that such relationships hinder the supervision of the firm, the authorization may be denied.
- Similarly to the case of management companies, an investment company that wants an authorization must be managed by individuals with sufficient experience, financial expertise, and reputation within the industry, to ensure that the business is carried out correctly.
- In addition to the aspects mentioned above, the country in which the authorization is sought may request any other information considered relevant to the investment company.

Upon receipt of the authorization in the member state in which it was requested, the investment company may be established and perform services in all member states of the European Union without the need to reapply for authorization in each one of those countries. Moreover, this authorization may be revoked at the same existing assumptions that apply for management companies.

Regarding its operational aspects, it must be noted that an investment company, unlike a management company, can only manage its own assets and it is not authorized to take over the management of assets on behalf of third parties. Along with this and, as is the case of the management companies, the competent authorities of the different member states in which the investment company operates, may ask the management company to implement certain procedures and internal control mechanisms, as well as data protection controls, in order to protect the interests of its investors.
On the other hand, an investment company that provides services in any of the member states of the European Union, shall make available to the general public other information concerning its activities, such as a prospectus of each of the funds distributed that must include all the necessary and relevant information explained in a simple and precise way; annual accounts, in which a balance sheet and a profit and loss statement must be included; as well as a report including the various relevant activities carried out by the company over the first half of the year. In addition, all the above information must be made available to all the investors who require it free of charge.

In those cases where a given UCITS wants to distribute its units in a different member state than its home country, it shall inform to the competent authorities of the country or countries in which it intends to sell these units and make available to those authorities all the relevant information on aspects such as the fund rules; instruments in which it invests; brochures of the compartments or different funds distributed; as well as any other information that wants to provide. As in the case of management companies, the investment company may start selling its various products two months after making such communication.

Furthermore, and once it has begun distributing its funds in other member countries other than its country of origin, the investment company shall make available to the investors of those countries exactly the same information required in the country of origin, but in these cases in the official language of these countries. Along with this, all those companies that market various investment funds must provide details of each of the funds sold, including the profile of the investors targeted, as well as all the costs and expenses associated, distinguishing between those paid by investors of those paid by the investment company.

On the other hand, the various competent supervisory authorities in all countries in which a given fund is marketed, must cooperate to carry out the oversight of all those investment companies operating in several member states in the most effective way to thereby ensure the protection of the interests of investors.

3.2.3.2 Directive 2001/108/EC or Product Directive

The Directive 2001/108/EC of 2002, also known as the Product Directive, introduced major reforms that allowed UCITS to carry out investments in a greater number of assets, thus greatly increasing the flexibility of this type of investment vehicles.

You can access to a digital version of this Directive through the website of the ESMA at the following link:

The following table summarizes the main aspects introduced by the Product Directive.

![Table 22: Product Directive
Main aspects introduced by the Directive](image)

The first important aspect that introduced the Directive 2001/108/EC of 2002 is the fact that it defines more accurately the securities in which UCITS are allowed to make investments. Within this broad definition, the securities in which UCITS can invest will be company shares or other securities equivalent to those shares, as well as bonds and other debt instruments issued by companies. In addition, it also allows UCITS to carry out investments in money market instruments, which are very liquid due to their lower maturities, and whose value can be determined at any time.

Along with the above aspects, the Directive also adds new assets in which UCITS funds may carry out investments, among which are the following:

- Deposits in credit institutions that may be recovered at any time or that have a maturity of less than one year, provided that such credit institutions have a registered office in one of the member states. In addition, investments in deposits in credit institutions that are not registered in any state of the European Union were also permitted, but only if these institutions are supervised in a similar way than in the European Union.

- Money market instruments that are not traded on a regulated market, but as long as the issue or the issuer of such instruments is regulated to ensure the interests of investors. Some examples are instruments issued or guaranteed by a central bank or by a central, regional or local authority of any of the member countries of the European Union; instruments issued or guaranteed by the European Central Bank, the European Union or the European Investment Bank; as well as...
those instruments that are issued by non-members countries, but as long as the instruments are guaranteed, among others.

- Units of other UCITS funds registered in any of the member states of the European Union or in third countries, provided that certain conditions are met to ensure the protection of the interests of investors.

- Financial derivatives, either traded on regulated markets or OTC. In this regard, certain conditions must be met, such as that the underlying asset must be an asset in which a UCITS fund may carry out investments, either an index, interest rates or currencies; the counterparty in a transaction that takes place OTC must be supervised by a competent authority; as well as that the fund must be able to calculate the value of OTC instruments daily and to close the contract at any time.

Furthermore, the Directive also requires that management and investment companies that conduct operations within the European Union, must have procedures, mechanisms, and risk management policies, that allow them to know at all times the risks associated to the various positions taken on an individual basis, as well as at portfolio level.

Along with the above mentioned aspect, funds must also have different mechanisms that allow them to assess in a precise way all the OTC derivatives, since the Directive obliges management and investment companies to submit periodically to the supervisory authorities all the information concerning the various positions in derivatives taken by the fund; the methods used to value these products; as well as the risks of each of these positions, among others.

The Directive also states that the total exposure of a UCITS fund to financial derivatives cannot exceed the net value of its portfolio. Along with this, all the investments made by UCITS are subject to certain restrictions that must be followed at all times, and that are aimed to prevent that the fund's investors may have to face significant losses in cases where bets in derivative products have been inadequate or incorrect.

Within the various limits that must be followed by UCITS when carrying out investments, are the following:

- A UCITS may not invest more than a 5% of its managed assets in transferable securities or money market instruments issued by the same issuer, in the same

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166 Calculated taking into account aspects such as the value of the underlying assets, the counterparty risk, future market movements and liquidity of the instruments, among others.
way that it can’t hold more than a 20% of its total assets in deposits with the same entity. However, a member state may raise the limit from a 5% to a 10%, but the sum of the positions of a fund that represent more than a 5% of its assets under management may never exceed the 40% of such assets.

- Any member state may increase the 5% limit to a maximum of a 35%, provided that the transferable securities or money market in which UCITS may carry out investments are issued or guaranteed by any member state, local authorities, international bodies in which any EU country participates, as well as by third countries.

- The 5% limit can also be increased to a 35% in those exceptional regulated markets in which a particular issuer of securities or money market instruments is dominant.

- Just as in the previous case, the 5% limit may be increased to a maximum of a 25% for those bonds that have been issued by institutions that have an office in the European Union and that are monitored and supervised by public agencies in order to protect the interests of bondholders. In these cases, the sum of the positions of a UCITS that represent more than a 5% of its assets under management may never exceed the 80% of such assets.

- Member states may also increase the 5% limit to a 20% for investments in securities and bonds issued by the same entity, provided that a given UCITS is aimed to replicate an index of stocks or bonds, but only if that index has a sufficiently diversified composition and is representative of the market.

- In cases in which a UCITS fund enters into a repo or reverse repo, it must ensure that it can recover the money at any time.

- A certain UCITS may invest in other UCITS funds, provided that it does not invest more than a 10% of its assets under management in a single UCITS. In this regard, member states may raise the limit to a 20%.

- The total sum of the positions taken in UCITS funds may not exceed the 30% of assets under management.

- In OTC derivatives, a UCITS fund can’t enter into any transaction that requires it to face a risk exposure of more than a 5% of its total assets as a rule, or of a 10% in those cases in which the other counterparty is a credit institution.

- A UCITS fund may not have positions in securities, money market instruments, deposits, or even OCT transactions, with the same issuer if the value of these positions is greater than the 20% of its assets under management.
• UCITS may not invest in assets such as real estate to speculate; precious metals; bank loans; as well as in any commodity, although in the latter case, they are allowed to enter into derivatives contracts whose underlying may be a given commodity index.

Along with the aforementioned limits, the Directive also includes certain aspects that must be included in the prospectus of those UCITS funds that are marketed in the European Union. In this regard, the prospectus must include the different categories of assets in which the fund is able to invest; the products in which the fund has invested, distinguishing between those that are used to hedge other positions or to implement a specific investment strategy; as well as the risks that pose these products. Moreover, in situations where the NAV of the fund may experience periods of high volatility, this aspect must also be included in the prospectus so that investors may know it and consider it when making investment decisions.

Also, naked short selling is prohibited at all times for both investment companies and management companies, in order to avoid problems that may arise in situations where investors may have to cope with heavy losses. However, it is noteworthy that, regardless of the fact that UCITS cannot sell short a physical security, either stocks or bonds, in contrast to hedge funds, they can build a position with the same effect by entering into derivatives contracts.

Another aspect to consider is the fact that UCITS funds must be distinguished between those considered as sophisticated, which are managed by using more complex techniques and that are allowed to invest in certain derivative products with the aim of achieve higher returns, and those that are considered as unsophisticated, which are aimed at investors with a much more conservative risk profile.\textsuperscript{167}

The following table shows a summary of the main features, which will be analyzed afterwards, of sophisticated and non-sophisticated UCITS.

\textsuperscript{167} To delve more into the most important aspects related to risk management included in UCITS III, the following book is recommended: Szylar, C.: \textit{Risk Management under UCITS III/IV: New Challenges for the Fund Industry}, Wiley, 2010
Sophisticated UCITS are those that, due to their characteristics, have more similarities with hedge funds. This type of funds are allowed by the existing legislation to implement more complex strategies, investment procedures, management techniques, as well as to invest in assets that exhibit higher levels of risk. Among their main features are the following:

- Sophisticated UCITS funds must include in their corresponding brochures all the different products used in the investment strategy, distinguishing between those used exclusively for the purpose of hedging, of those other employed to maximize returns of a given strategy.

- Along with the above information, sophisticated funds must detail and send to the competent authorities of their country of origin a report that must include the management methodology that will be applied in the fund, as well as the various procedures aimed at internal control and risk management.

- A sophisticated fund, regardless of the fact that it is not allowed to conduct short sales, can enter into derivatives transactions, such as equity swaps, that allow it to replicate the effect of these short sales, although in this case these transactions must be reported to the competent authorities and to the fund's investors.

- At all times, the fund must inform to its investors and to the competent authorities of the level of risk taken. This will be made by calculating the volatility, both at aggregate level and individually for each of the positions that

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### Table 23: Main features of sophisticated and non-sophisticated UCITS

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<tr>
<th>Non-sophisticated funds</th>
<th>Sophisticated funds</th>
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<tr>
<td>- Traditional ‘long-only’ equity portfolios that contain physical holdings as assets</td>
<td>- Additional portfolio scope, including additional asset types/classes, derivatives and investment strategies</td>
</tr>
<tr>
<td>- Derivatives are only used for Efficient Portfolio Management (EPM)</td>
<td>- Symmetry, hedging and other derivative strategies permitted for investment purposes</td>
</tr>
<tr>
<td>- Derivatives cannot be used to create symmetry within a portfolio</td>
<td>- Required to disclose derivative usage in investment objectives</td>
</tr>
<tr>
<td>- No disclosure on derivatives required within investment objectives</td>
<td>- Sophisticated risk measurement technique i.e. Value at Risk (VaR) must be calculated on a daily basis</td>
</tr>
<tr>
<td>- The ‘commitment approach’ to risk measurement calculates exposure in terms of the obligation to a third-party, including predicted market moves</td>
<td>- Required to submit a sophisticated risk framework with regulators</td>
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<tr>
<td>- Required to submit a non-sophisticated risk framework with regulators</td>
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</tbody>
</table>

Source: Compiled by author based on Henderson Guide to UCITS
compose the portfolio, and the VaR (Value at Risk) or other advanced metrics designed to assess the risks of a given portfolio.

- When investing in several assets, sophisticated UCITS may carry out investments in a more flexible manner and similar to hedge funds, but nevertheless they still have investment restrictions when investing in certain assets, such as real estate or commodities, as well as certain limits applied to the investments made.

- All the above features make this type of funds suitable for investors with a moderate or high risk profile since, although they are subject to strict regulation and to some limits when implementing certain strategies, the possibilities of these funds to achieve higher returns due to their greater flexibility are higher.

On the other hand, UCITS funds that are considered unsophisticated will have limited flexibility to operate, as they will have as main objective the preservation of capital of the investors. Among their main features are the following:

- Non-sophisticated UCITS funds may carry out the same investments than sophisticated UCITS, either in stocks, money market instruments, debt instruments, as well as in deposits, provided they comply with the limits set out in existing legislation.

- In the case of non-sophisticated funds, they will not have the obligation to report within the investment objectives all the derivative products used, as it will be understood that such products will be used exclusively to increase efficiency in the management of the fund and not to implement riskier strategies to increase returns.

- Unlike sophisticated funds, non-sophisticated UCITS funds may not use sophisticated products unless these products are used solely to hedge exposures of the portfolio. In other words, the products should be used as part of a portfolio that has as its main objective to preserve the capital of the investors and to ensure their interests, as well as to achieve the objectives of the fund.

- A non-sophisticated fund may not enter into derivatives transactions in order to replicate the effect of short sales, so that the fund will behave as a long-only investment fund.

- Unsophisticated UCITS will have to implement procedures for risk management that must be sufficiently robust to ensure and to protect the interests of investors, but will have no obligation to calculate complex metrics such as VaR. In this regard, when calculating the risk, the fund must consider aspects such as exposures to certain counterparties, credit risk, as well as potential future market movements.
All the above aspects, make unsophisticated UCITS intended solely for investors with a low risk profile, because due to their lower flexibility they are focused on the preservation of capital of the investors and to keep the risks assumed at minimal levels.

The various reforms introduced in 2002 by the Management Directive and by the Product Directive, allowed an impressive growth of the UCITS industry in the years after their introduction. However, and in order to provide UCITS with more flexibility to make them more similar to hedge funds, but still protecting the interests of investors, in recent years the EU countries have reached new agreements to introduce further amendments, being the first one of these agreements known as UCITS IV.

3.2.4 The entry into force of UCITS IV

The Directive 2009/65/EC of 2009, also known as UCITS IV, introduced important reforms to further increase the efficiency in the management of UCITS and to improve the protection of the interests of all those individuals who choose to make investments in this type of investment vehicles. Many of these amendments were applied to the Management Directive, although other important aspects to be taken into account when establishing a UCITS fund and even for those who decide to invest in these products were also modified.

This directive, approved in 2009, entered into force in 2011, although only a very few countries met the requirements, such as Luxembourg and Ireland, among others.

The main aspects introduced by the Directive are summarized in the following table.

| Table 24: Directive 2009/65/EC of 2009  
Main aspects introduced by the Directive |
<table>
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<tbody>
<tr>
<td>Introduction of the possibility that UCITS may have different compartments or sub-funds</td>
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<td>Introduction of the possibility that registered management companies may manage UCITS in a remotely way</td>
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<tr>
<td>Simplification of the registering process of management companies</td>
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<tr>
<td>Introduction of the possibility that UCITS funds or compartments may merge with other funds or compartments</td>
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<tr>
<td>Definition of the requirements to obtain authorization to carry out a merger</td>
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<tr>
<td>Definition of aspects applicable to UCITS master-feeder structures</td>
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<tr>
<td>Definition of the obligations of master and feeder funds</td>
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<tr>
<td>Definition of obligations concerning the information distributed among investors by management and investment companies</td>
</tr>
<tr>
<td>Definition of the powers granted to supervisory authorities</td>
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</table>

Source: Compiled by author based on Directive 2009/65/EC of 2009
The first of the relevant aspects included in the Directive 2009/65/EC of 2009\textsuperscript{168} is the fact that member states of the European Union could allow UCITS funds established within the borders of the Union to have different investment compartments or sub-funds designed to increase their efficiency and that could be managed according to different investment objectives. These compartments shall be considered as UCITS funds independent from each other and will be entitled to invest in all the assets included in the Directive, as long as the limits defined on it are met. In this regard, the Directive 2009/65/EC does not include significant changes with regard to the aspects covered by the Product Directive analyzed previously.

Along with the above aspect, it is also noteworthy that the Directive introduced the possibility for all those management companies registered in a member state to manage funds registered in any of the different countries of the European Union remotely, thus allowing an increase in efficiency and a reduction of costs.

In addition, it also greatly simplifies the process of registering all those management companies or investment companies wishing to provide services in several countries of the European Union. In this regard, the notification of authorization by member countries to a given investment management company will decrease from 60 to 10 business days from the time of submission, in the same way that an electronic procedure is established whereby the relevant regulatory authorities of a country may notify in a very fast way to other regulatory authorities in the European Union, and even to the fund itself, aspects relating to the registration of new UCITS and compartments.

Another important aspect introduced by the Directive is the fact that a particular management company may manage UCITS funds regardless of whether it is registered in the same member state in which such funds are distributed or in another country. For this, the management company may open a representative office in countries in which it wish to provide services or simply invoke the freedom to provide services across the European Union. In such cases, the management company must comply with existing legislation in each of the member states in which are marketed its several managed funds. This legislation typically includes different aspects such as those shown below, among others:

- Aspects relating to the establishment and authorization of the UCITS.
- Information regarding the various accounting and asset valuation methods used by the fund.
- Relationship of the fund with its investors.

\textsuperscript{168} You can access to a digital version of this Directive through the website of the ESMA at the following link: \url{http://www.esma.europa.eu/system/files/L_302_32.pdf}
- Marketing strategy of the fund.
- The policy that applies to the fund distributions or reinvestment of the income earned in certain investments made.
- Restrictions of the fund to carry out short sales.
- Investment policy of the fund, including the strategy implemented, the objectives of the strategy, risk management mechanisms, as well as limits or restrictions applicable to it.
- Detail of the clauses governing the issuance and redemption of the fund units.

On the other hand, the management company will be responsible for complying with all the requirements defined in the UCITS fund, as well as with the various obligations contained in its brochure. Also, the supervision of the management companies will be carried out by the competent authorities of the country of origin of the funds. In addition, the competent authorities of each member state in which a particular management company operates, may request information on the activities undertaken to perform statistical analyses, as well as to ensure that such management companies comply with all the requirements contained in the existing legislation and in the rules of the UCITS managed.

The depositary chosen by a fund to safeguard its assets in order to protect the interests of investors must be totally independent of the fund and can’t be the fund's management company. Also, the depository will face certain obligations contained in the Directive, among which are the following:

- To ensure that all transactions, such as sales, issues, repurchases or redemptions of units of a specific fund are made in accordance with the applicable law and with the rules of the fund.
- To ensure that any consideration or aspect applicable to all the transactions carried out by the fund will be reported to the fund as soon as possible.
- To follow the orders of the management company, unless such orders are contrary to existing law or to the rules of the fund.
- To ensure that the valuation of the units of a given fund is carried out according to the law and following the methods defined in the rules of the fund, in order to prevent frauds and deceptions to investors.
To ensure that the income of the fund is calculated according to the current legislation and as defined in the rules of the fund.

In addition, the depositary must be registered or established in the home country of the fund, and must be supervised and monitored by the competent authorities of that state. Along with this aspect, it must be known that, in those cases in which a certain depositary has conducted wrong and unjustified activities that have resulted in large losses to investors or to the fund's management company, it will be liable for such losses.

Another important innovation is the fact that the Directive also includes the fact that UCITS, or the compartments that may exist within such funds, may merge or, in other words, that the managed assets and liabilities of a certain fund or compartment may be transferred to another fund or compartment. These mergers may be carried out in situations in which a given UCITS is being liquidated or in bankruptcy, and in those in which several funds or compartments agree to create a fund or a larger compartment, thus allowing them to increase efficiency and to compete within the industry in a better way.

When carrying out a merger, a fund must first obtain authorization of the state or member states of origin of the funds that will be involved in the merger. In these cases, funds must provide to the relevant competent authorities of these states the following information:

- A draft in which the terms of the merger proposal are approved by all those funds that will be involved in it. Within these terms, it must be included aspects such as the type of merger proposed; funds or compartments involved; the objective of the merger; the potential impact of the merger on the investors of both funds; the expected date of completion of the merger; the different rules that will apply when transferring assets and liabilities of one fund to another; as well as any other aspect that the funds involved want to include in the draft of the merger.

- An updated prospectus and any information relevant to investors of the UCITS that will receive the assets in the merger, but only if that fund is based in a country other than the country of origin of the fund that will transfer its assets and liabilities.

- A report written by the trustees of both funds in which it must be included that they have verified the terms of the merger, thereby abiding the rules of both funds and the existing legislation. Some of the aspects that must be included in this report are a validation of the different criteria used when valuing assets and liabilities of the funds that must be taken into account when determining the
units of the new fund that investors will receive after the merger; validation of the cash received for each unit; as well as an acceptance of the methods used to calculate the number of units that investors will receive of the new fund, among others.

- A copy of the report written by the independent auditors to verify compliance with existing legislation in the merger. This report must be distributed free of charge among all investors of the funds involved in the merger if it is requested, as well as among the competent authorities of the member states of origin of the funds involved.

- Any information relating to the merger that the funds involved are planning to distribute among their investors, so that they may know in advance the effects of the proposed merger. This information will only be distributed to investors in those cases in which a merger has been authorized.

Along with the above aspects, it is possible that, in certain member states of the European Union, the law requires the prior approval of the proposed merger by investors of a given fund. In these cases, countries must ensure that such approval does not require more than three quarters of the votes of investors represented at the general meeting.

On the other hand, the various administrative, legal or advice costs related to the preparation of the merger may not be charged to any of the funds or to investors, unless one of the funds involved in the merger does not have assigned any management company, which is usually not common. In addition, the entry into operation of the new fund after the merger must be defined appropriately in the legislation of the country or countries in which is conducted. This entry into force will have the following consequences:

- All the assets and liabilities of the fund that will merge with another will be transferred to the receiving fund or to its depositary, as applicable.

- Investors of the fund that will merge with another fund will become investors of the receiving fund or of the newly created vehicle. Moreover, in some cases, these investors have the right to receive a certain amount of cash that may not exceed the 10% of the value of the new units received.

- After the merger is completed, the fund that transferred all its assets and liabilities to the receiving fund will cease to exist.
Once the relevant authorities of the country or countries of origin of the funds involved have approved the merger, the new fund may be marketed in all the member states of the European Union.

In those cases in which funds or compartments that merge are located in the same country of the European Union, the merger will be domestic, whereas if the funds or compartments that carry out a merger are located in different countries, the merger will be cross-border.

The following figure shows an example of a cross-border merger.

**Figure 32: Example of a cross-border merger**

![Diagram showing cross-border merger]

Source: Compiled by author based on information from “Analysis of the tax implications of UCITS IV”. EFAMA/KPMG

Whatever the type of merger that takes place, the funds or compartments that will disappear must provide their investors units of the new fund or compartment that has been created through the merger, and these units shall be equivalent in value to those that investors had in the initial fund or compartment.

Furthermore, those UCITS wishing to carry out activities within the European Union must receive proper authorization of one of the member states. In this regard, a given fund will be authorized in cases in which its management company, its rules and its
depository are all approved by any country of the European Union. Once a fund has chosen its management company, which must be from the same home country of the fund or from another member state, its depositary and its fund rules, they may not be modified without an authorization of the competent authorities of the country of origin of the fund.

Once a UCITS fund has received an authorization, it will be valid for all the member states of the European Union. In addition, in certain third countries, the distribution of UCITS funds are also allowed. In fact and, in countries outside the EU where the marketing of a UCITS fund faces some problems, the member countries of origin of such funds may report the situation to the European Commission so that it can take action and reach agreements to solve the situation.

This authorization, in turn, may be withdrawn if the conditions required by existing legislation are not met; the management company is not entitled to manage UCITS funds in its country of origin; the fund managers do not have sufficient knowledge, experience and reputation within the asset management industry to carry out the management of the fund; as well as if the fund is not allowed to be distributed in a certain country due to legal issues, among others.

Another of the important innovations introduced by the Directive is related to the master/feeder structures.

A feeder UCITS fund have the obligation to invest at least the 85% of its assets under management in a master UCITS. The remaining assets of the feeder fund may be invested in liquid assets; derivative instruments with the sole purpose of hedging; as well as in real estate, but in this last case only if these investments are not purely speculative, among others. These conditions must be verified by the competent authorities of the member states of origin of the feeder UCITS.

On the other hand, a UCITS will be considered as a master UCITS only if it has at least one feeder UCITS fund; has not invested in any other feeder UCITS; and provided it is not a feeder of any other master UCITS.

As happens in other cases, all investments that a feeder UCITS carries out in master UCITS funds must be authorized by the competent authorities of the country of origin of the feeder fund. The request for approval must include certain aspects, among which are the following:
- The rules of the fund, as well as the investment policy of both the master fund and the feeder fund.

- In cases where the feeder fund is based in a country other than the country in which is based the master fund, it must demonstrate to the competent authorities of its country of origin that the master fund is a UCITS. In this regard, the competent authorities of the country of origin of the master fund will have to certify this aspect.

- The agreement between the two funds, in which the feeder commits itself to invest at least an 85% of its assets in the master UCITS.

- If both funds have different depositaries or auditors, the agreement between all of them to share information. This aspect is important because, if the obligations of each of the depositaries or auditors are not defined, future problems that may threaten the interests of investors of both funds may arise.

- The prospectus, as well as any other relevant information to the interests of all the investors, of both funds.

- The information that will be distributed to all the investors of both funds.

- Any additional information that may be required by the competent authorities of the countries of origin of both funds.

Once the structure has been launched, both funds must be coordinated for the calculation of the NAV in order to avoid arbitrages, and must put into practice different rules applicable to both of them in order to carry out all the operations necessary for the proper conduct of the business in the best and most efficient possible way. Also, the feeder UCITS will be the responsible to supervise the activities carried out by the master fund, for which it will rely on the information provided by the master fund or, in certain cases, by its appointed management company, custodian or independent auditor.

On the other hand, if a given master fund is liquidated, all its feeder funds will be liquidated too, unless they are allowed to transfer their assets to another master fund or to become normal UCITS funds. In addition, feeder funds must be liquidated too in those cases in which a certain master fund is divided or merges with another fund, unless they are allowed to remain as feeders of the master fund or of the new fund created after the merger; or in which competent authorities allow them to invest in another master fund or to become regular UCITS funds.

Regarding the information that all feeder UCITS funds must distribute among their investors, it must be noted that the member states of the European Union require that
The prospectus of the funds must include all the relevant information of the funds. This information must include the following aspects:

- The fund's investment policy and its objectives, including expected returns and levels of risks assumed.

- The fund shall clearly indicate that it is a feeder fund of another master UCITS fund and that is required to invest at least an 85% of its assets in that master fund. This aspect should be clearly highlighted in all the marketing documents distributed by the fund among investors.

- Tax implications of the structure.

- All the costs paid by the feeder fund to the master fund, as well as the costs payable by the feeder fund's investors.

- Information relating to the agreement between the master and the feeder fund. In addition, the feeder fund must also provide investors all the information about the master fund or, at least, indicate where they can obtain such information.

- A description of the master fund in which the feeder fund invests.

- Furthermore, in those cases in which a feeder fund wants to stop being a feeder or even to change its master fund, it must also provide all the relevant information required to the competent authorities of its country of origin.

The Directive also includes relevant amendments concerning the information that management and investment companies must publish and provide to investors. Particularly, the Directive requires to provide investors a document known as "Key Investor Information", which must be drafted in a precise and easily understandable way for all investors, and that must include several important aspects. This document shall be exactly the same for all the member states, with the only difference of the language in which it is presented, and must be consistent with the information contained in the fund prospectus. The main aspects that must be contained in this document are the following:

- The identification of the UCITS fund, so that investors will have access to some information on the fund through various financial services providers.

- The fund profile based on the expected returns and risks, as well as a clear description of the risks associated with investing in the fund. In this regard, the document must include also the risk category of the fund according to the scale shown below.
• A description of the strategy and the investment objectives of the fund.

• A track record of the fund, as well as the future expected performance in different scenarios.

• All the costs that will be paid by the investors of the fund.

• All the different ways to obtain additional information of the fund.

Also, the key investor information document must contain additional information in all those cases in which the fund has certain special characteristics.

• If the fund has different compartments, the document must contain relevant information of each of the compartments, including how to transfer investments from one compartment to another, as well as the cost associated with such action.

• In master/feeder structures, it must include clear information that states that the fund is a feeder or a master fund.

• If a fund has different classes of units, the document must include relevant information regarding the different classes.

• In the case of funds of funds, it must be clearly stated that the UCITS funds invest in other UCITS funds.

• If the fund has a complex or tailored structure, the document shall include all the relevant information of the structure to enable investors to know in detail the product in which they carry out their investments.

Finally, it must be noted that the Directive also sets out the powers granted to the supervisory authorities, which may conduct their oversight tasks in a directly way or in collaboration with the supervisory authorities of other countries. Some of these powers granted, among others, are the following:

• To request temporary prohibition of activity.

• To force the cease of certain practices that are contrary to law.

• To remove the authorization granted to a management company, depositary or UCITS.
- To suspend the issue, redemption or repurchase of the fund's units in those cases in which it may jeopardize the interests of investors.

- To carry out physical inspections and visits to the overseen entities.

- To submit information that may be used in criminal prosecutions.

- To seize or confiscate a fund's assets in certain special situations.

- To access to all kind of information such as paper documents, telephone conversations or digital registers, among others.

- To adopt any type of measure aimed to ensure that investment companies, management companies or depositaries comply with current legislation.

- To work closely with independent auditors or external experts to carry out additional checks or to draft reports.

On the other hand, the member states are responsible to impose the various penalties and fines for those behaviors that have been conducted contrary to the provisions contained in the Directive. Also, they may make public all information regarding penalties and fines imposed, provided it does not jeopardize the interests of any of the parties involved or that may cause instability in the financial markets.

### 3.2.5 The future of UCITS

One of the important aspects of UCITS is the fact that the applicable regulation has evolved greatly over recent years in order to bring them closer to hedge funds, as well as to protect the interests of investors in a much more effective way, particularly after the various financial scandals occurred in recent years, within which it must be highlighted the Ponzi scheme orchestrated by Bernard Madoff, in which a great number of European investors had to face heavy losses after being scammed.

The last of the agreements reached between the member states of the European Union materialized in the Directive 2014/91/EU of 2014\(^\text{169}\), also known as UCITS V, which introduced various changes relating to depositaries, remuneration policies of the managers and administrative sanctions. The main aspects introduced by the Directive are summarized in the following table.

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Regarding to remuneration policies, the Directive establishes that member states shall require that management companies must implement remuneration policies aimed to the implementation of proper risk management and not to promote risk taking by managers. The remuneration may consist of a fixed salary, a performance-based variable pay, as well as of several benefits and perks. Some of the aspects that must be met by a correct remuneration policy are the following:

- The remuneration must be in accordance with the strategy and objectives of the fund, in the same way that it must align the interests of the fund management company with those of investors.
- It should encourage proper and effective risk management, and never promoting risk-taking that may endanger the stability of the fund and the achievement of its objectives.
- The remuneration policy must be approved and reviewed annually by the board of directors of the management company, which will also be responsible for the overseeing and implementation of it. This policy also must be subject to an annual internal review.
- The fixed remuneration must be sufficiently important within the total remuneration in order to allow some flexibility when setting the variable remuneration.
- Termination payments of a particular contract shall be based on the performance of the individual and may not never reward failure.
- All the performance-based remuneration should consider issues such as an assessment of the individual; the fund or business unit performance; the performance of the management company; as well as the risks taken, among others.
At least a 40% of the variable remuneration should be paid on a deferred basis over time, with a minimum of three years, in order to align employee interests with those of the company. In addition, the variable remuneration will be paid only if it is consistent with the financial situation of the company at any given time.

All those employees responsible for controlling certain areas within the company must be paid in accordance with the achievement of objectives relating to the activities carried out, and never depending on the performance of the areas that they control.

Guaranteed variable remuneration must be limited solely to new hires and to the year in which such employees have joined the company.

Furthermore, the Directive also introduced important changes relating to depositaries.

First, a depositary may be a central bank, a credit institution authorized in the European Union, or any other legal entity permitted by any member state of the European Union to perform depositary activities, provided that they met certain aspects, among which are the following:

- It must have an appropriate infrastructure to carry out the tasks of a depositary and to avoid potential conflicts of interest.
- It must conduct a proper business management to ensure the future sustainability of its operations.
- It must have financial and administrative procedures, techniques of risk assessment, as well as internal control procedures designed to protect the interests of investors.
- It must have internal control procedures to ensure compliance with the law.
- Its employees must have enough experience, knowledge and reputation in order to carry out the business in the best possible way. In addition, they shall carry out the tasks assigned in an ethical and honest way.

The Directive also added new functions to depositaries, among which are the following:
• The depositary may not use the assets it holds in custody for its own benefit without authorization of the fund, unless the use of such assets is beneficial to the fund or to the interests of its investors.

• A depositary shall not delegate its functions to a third party, unless there is an objective reason for the delegation, or has analyzed in depth to that third party and concluded that it will be able to carry out the tasks assigned in a correct way. In addition, the third party will be treated as a depositary and therefore must meet certain requirements and implement several mechanisms required by legislation, in order to carry out the tasks assigned in the best possible way.

• It must provide any information that may be requested by its competent authorities.

• It must send a list, regularly updated, to the management or to the investment company that must include all the assets of the UCITS.

• It must control the various cash flows of the fund, with special emphasis on all the payments received from investors at the time of subscription of new units of the fund.

• All the cash of the fund must be kept in cash accounts that must meet certain characteristics, among which are that the account must be opened in the name of the fund, its management company or the depositary itself; as well as that it must be held in a central bank, a credit institution authorized in the European Union or in a third country, as well as in a qualified monetary fund, among others.

• A depositary may not be also a management or investment company. Moreover, it must carry out the tasks assigned honestly, as well as in a fair and ethical manner, and always seeking the best for the interests of its investors.

• In those cases in which a certain depository is insolvent, the member states shall ensure that the assets held in custody by the depositary will not be distributed until the situation is resolved.

• It also must have in custody the financial instruments, as well as any other assets of the fund. In the case of financial assets, they must be kept in a securities account, while in other cases the depositary shall verify that the UCITS, or its management company, is the owner of such assets. It must also maintain a record of all the assets of the fund.

• The conditions to change the depositary must be contained in the law or in the rules of a fund or investment company.

• The depositary will be liable in those cases in which one of the assets under custody has been lost, and in situations that caused losses to a fund due to
improper or negligent conduct. In those cases in which a depositary has lost an asset, it must return an equivalent asset, unless it can prove that the loss was caused by an external event beyond its control.

Due to the various changes relating to compensation policies and depositaries, the Directive also included several changes affecting the information distributed by the funds among investors, as well as to the powers granted to the supervisory authorities, among which are the following:

- The fund's prospectus must include details of the remuneration policy, including the calculation method, as well as the people responsible of it, among other things.

- The key investor information document must include the competent authority of the UCITS fund, as well as information on the remuneration policy.

- The annual accounts must also detail the annual compensation paid. In this regard, they must detail the fixed and variable compensation; the remuneration paid by the management company and by the investment company; the amount paid by the UCITS fund; all the beneficiaries; the calculation method; the remuneration paid to the different groups of employees; as well as the major changes introduced in the remuneration policy during the period, among other things.

- The competent authorities may access to phone records maintained by a particular operator if they have suspicions of inappropriate behavior or to use those records in an investigation, as long as it is permitted by the national law.

- A supervisory authority may also obtain telephone conversations or electronic data held by a UCITS, custodian, or by a management/investment company.

On the other hand, it must be noted that the Directive also includes amendments relating to the rights and obligations of member countries when setting penalties and fines for those funds, depositaries, management companies or investment companies that have carried out inappropriate and illegal behaviors. In this regard, the Directive contains certain obligations applicable to the member states of the European Union with the aim of protecting and safeguarding the interests of investors and to prevent fraudulent behaviors similar to the ones conducted in recent years.

Finally, and regardless of the fact that UCITS V was approved in 2014, it is noteworthy the future commitment of the member states of the European Union to further develop the UCITS fund industry inside and outside Europe, while maintaining investors’ confidence and safeguarding the interests of all of them through a robust and efficient
legislation. In this regard, several public consultation documents were developed, among which must be highlighted the one titled “Product Rules, Liquidity Management, Depositary, Money Market Funds, Long-term Investments” of 2012\textsuperscript{170}, which involved a large number of individuals, organizations, financial institutions and asset managers, and that laid the foundations of what in the future will be known as UCITS VI.

\textsuperscript{170} You can access to a digital version of this document on the website of the European Commission through the link shown below. However, it must be clarified that this is a consultation document that has as main objective the consultation of certain aspects to the members of the asset management industry, so that it won't condition any decision that the European Commission may take in the future. 

3.3 ADVANTAGES AND DISADVANTAGES OF UCITS

UCITS funds have a number of advantages and disadvantages that must be known by those investors who are evaluating the possibility of investing in this type of pooled investment vehicles, among which are the following\textsuperscript{171}.

3.3.1 Advantages

- **Professional Management:** The first of the positive aspects of UCITS funds is the fact that the existing regulation demands that they must be managed by a number of individuals that must submit a minimum level of experience, expertise and reputation within the asset management industry in order to carry out the management of the funds in the best possible way. In this regard, it is required that the portfolios of UCITS funds must be managed efficiently by applying a series of mechanisms, and advanced management techniques, aimed at the construction of the portfolio according to the objectives and the rules of the fund to thereby protect and safeguard the interests of investors.

  This aspect is particularly relevant for all those investors who lack sufficient financial knowledge, or enough time, to manage their own assets, who may choose to invest in a UCITS fund with the guarantee that their assets will be managed by professionals that will seek the best for the interests of their investors.

- **Diversification:** Another important aspect of UCITS is the fact that the investments made by their managers must have a minimum level of diversification in order to avoid specific errors when making investment decisions that may negatively impact the fund’s performance, thus avoiding that investors may have to cope with heavy losses.

  Diversification is also one of the issues addressed in the various directives applicable to UCITS funds, in which are included certain limits and restrictions to carry out investments in certain instruments or asset classes, in order to avoid the concentration of investments in assets that may be highly correlated, as well as to prevent certain problems experienced by a single issuer, an industry or a particular country, that may endanger the future stability of the fund.

- **Risk management:** Derived from the two aspects mentioned above, UCITS are managed by applying methodologies, policies and procedures for risk management, aimed at minimizing the risks taken when carrying out certain investments, which are applied by different techniques, usually quantitative, in


which managers try to assess potential risks and possible losses that may suffer the fund if certain events or situations take place in the future.

For this task, UCITS often employ individuals with high expertise in risk management that work closely with managers when constructing portfolios designed to achieve a given performance objective defined in the prospectus and in the fund rules, while minimizing the risks taken by the fund, in order to guarantee and protect the interests of investors.

- **Prestige**: Due to the various campaigns carried out by the member states of the European Union in the last years, the UCITS fund industry has experienced a tremendous growth in terms of prestige within the asset management industry.

Currently, the UCITS brand is perceived by many investors, not only from the European Union, but also from other parts of the world, as a sign of quality that indicates that the interests of investors are guaranteed at all times due to the application of various techniques and procedures aimed to limit the risks taken by this type of investment vehicles, all without sacrificing attractive returns or new kinds of strategies aimed at investors with different risk profiles.

Moreover, it should be noted that certain countries outside the EU also allow the distribution of UCITS funds due to their prestige, as well as due to the high protection of the interests of investors that is guaranteed by a robust, innovative and efficient legislation applicable to this type of investment vehicles. The following figure shows the regions with the greatest number of UCITS.

**Figure 33: Regions with the greatest number of UCITS**

![Figure 33: Regions with the greatest number of UCITS](image-url)
• **European passport:** The fact that a particular UCITS fund that has been authorized in one of the member countries may be sold in all countries of the European Union, greatly facilitates the development of this type of investment vehicles, due to that investors may access to various funds that implement different strategies aimed to achieve certain objectives in terms of risk and returns, and that are targeted to investors with different risk profiles, without the need of being based in the same country of origin of the fund, and all of it with the protection of a robust and efficient legislation applicable to this type of investment vehicles.

This European passport is also extremely positive for the interests of all those who decide to launch a UCITS, as they do not have to register it in every country in which it is intended to be distributed, which increases efficiency and reduces costs. This allows all the UCITS funds to have an important competitive advantage over all those non UCITS investment vehicles.

• **Highly regulated:** UCITS funds have been experiencing a tremendous growth in recent years, due to the robust and efficient legislation applicable to all of them developed by the different member countries of the European Union in the last decades.

In this regard, investors are attracted to such investment vehicles due to the protection offered by existing legislation, since all of it is intended to protect and to guarantee the interests of investors, while providing UCITS funds with appropriate tools and mechanisms that allow them to present an important advantage for all those individuals who are interested in achieving high returns without endangering their interests.

Along with the above mentioned aspect, the strong supervision of UCITS by various authorities of the member states of the European Union is also a very important attraction to consider by all those investors who are willing to invest in these products.

Furthermore, it must also be considered as a very positively fact, the future commitment of the different member countries of the European Union to further develop the regulation applicable to the UCITS funds industry; to increase efficiency and further improve the protection of the interests of investors; as well as to further increase the flexibility of this type of investment vehicles.

On the other hand, the existing legislation also requires to this type of investment vehicles the implementation of various accounting and administrative procedures, internal control mechanisms, risk assessment controls, and data protection techniques that must be sufficiently robust and correct to ensure the development of the normal operating activities of the fund and its future sustainability. It also requires that such funds must accept one of the various codes of conduct that require them to carry out their various
activities in an ethical, professional and honestly way, and that have as main objective to prevent frauds, unethical behaviors and unfair practices similar to the ones conducted in recent years in several parts of the world.

All these aspects are aimed to prevent that investors have to carry out a laborious and expensive due diligence process of those UCITS funds in which they are considering to invest, something that is usually essential when carrying out investments in hedge funds, due to the little regulation applicable to this type of investment vehicles. However, it must be said that there is a large number of UCITS that add little or no value compared to other funds, so investors must conduct a careful selection, or delegate that selection to their financial adviser, to prevent carrying out an investment in a fund that do not provides any value but that, however, charges high fees.

- **Lower costs for investors:** UCITS funds usually have a fee structure that is similar to the one of hedge funds, as it is usually composed of a management fee applied to the assets under management of the fund, and a performance fee that is charged in those cases in which the fund has been able to achieve positive returns or to beat a certain benchmark defined in the fund's rules.

  However, it must be said that, generally, the management fee and the performance fee charged by UCITS funds to investors, are usually much lower than those of the hedge funds, so that this type of investment vehicles are usually targeted to the vast majority of investors due to their relatively low costs compared to other alternatives.

- **Large investor base:** The main characteristics of UCITS make them extremely attractive not only for retail investors, but also for a large number of institutional investors that choose to invest in this type of investment vehicles due to their regulation and to the flexibility that have gained in recent years. Furthermore, their open character and their lower investment requirements also helps greatly to the growth in the number of investors that decide to invest in UCITS.

  This aspect is very positive not only for the interests of investors, but also for UCITS, since a large number of investors may allow them to reach a level of assets under management sufficiently high enough to achieve economies of scale that increase their efficiency when performing daily operations, as well as to provide a better service to all investors with lower costs.

- **Diversity of strategies**\(^{172}\): Regardless of the fact that the flexibility of UCITS funds is still below the one of other collective investment vehicles, such as hedge funds, it is undeniable that, in recent years, there have been major developments in legislation that have increased the flexibility of UCITS funds.

In this regard, those UCITS that are considered sophisticated, have the ability to implement various strategies that are very similar to those developed by hedge funds, all under a legislation that is powerful enough to ensure the interests of all the investors.

Furthermore, in recent years has also increased the number of assets in which UCITS funds may carry out investments, thus allowing UCITS to develop strategies aimed to exploit opportunities in new assets and markets.

- **High liquidity**: As mentioned above, the applicable law in charge of regulating the UCITS industry has a number of restrictions and limitations when making investments that must be fulfilled by such funds in which, among other things, is included the fact that investments must be carried out in liquid instruments, as well as that funds must allow investors to subscribe or redeem units of the fund in a simple and quick way.

As can be seen in the following chart, UCITS usually have daily or weekly liquidity, unlike other investment vehicles such as hedge funds, so investors can invest and recover funds invested in these products without too many problems, which greatly increases its attractiveness.

**Chart 7: UCITS Liquidity**


- **Tax Advantages**: The diversity of the legal structures that UCITS funds may use, allows them to greatly increase their tax efficiency, thus allowing investors to access to certain fiscal advantages that greatly increase the attractiveness of this type of investment vehicles.

- **Transparency**: Another important aspect of UCITS is the fact that they have very high levels of transparency compared to other pooled investment vehicles.

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173 Thompson, P., Headley, T.: **UCITS or not UCITS Solving the technical challenges**, UCITS Hedge, 2011
such as hedge funds, which makes all those individuals that decide to invest in UCITS to have access to a lot of relevant information on the fund that allows them to be informed at all times not only on the performance of the fund, but also on different important aspects.

The high level of transparency\textsuperscript{174} of UCITS funds is explained again by the several obligations required by the applicable law to this type of investment vehicles, which refers to aspects such as the various documents that must be distributed among their investors, as well as to the information that must be provided to the competent authorities of the countries where they operate in order to monitor them in an efficient way. All this is usually designed to prevent certain unethical, fraudulent, or criminal behaviors, that are harmful not only for the financial services industry, but for the society as a whole.

- **High efficiency:** The various aspects included in the existing legislation applicable to the UCITS industry, allow to this type of investment vehicles to achieve a high level of efficiency when conducting their operations which, in turn, enables them to achieve significant competitive advantages over other existing investment vehicles within the asset management industry, being this one of the several key aspects that explain the strong growth that the UCITS industry has been experiencing over recent times.

In this regard, some of the structures that may choose UCITS funds at the time of the launch of the fund, as well as the possibility that have individual funds or compartments to merge, allow to this type of investment vehicles to increase their operational efficiency; to achieve economies of scale; to improve the various services and products offered to investors; to increase the liquidity of their units; to increase the speed in the distribution of their products among investors from different countries of the European Union and, ultimately, to adapt themselves more to the preferences and desires of investors.

### 3.3.2 Disadvantages

- **Lesser flexibility:** Regardless of the fact that, in recent years, the legislation applicable to UCITS funds introduced several changes aimed to increase the flexibility of this type of investment vehicles, their flexibility is still below the one of other products such as hedge funds.

In this regard, the several limitations and restrictions to which are subject UCITS funds when carrying out their investments, may be seen as an inconvenient to achieve superior returns and even to implement certain complex strategies that seek to exploit opportunities that may arise due to inefficiencies in the prices of certain assets. However, it must be said that recent studies concluded that “although absolute return UCITS deliver lower risk-adjusted

\textsuperscript{174} Wiedemeijer, O., Keller, U.: Alternative UCITS strategies, paradigm shift or expensive compromise?, Credit Suisse, 2013
returns than other hedge funds on average, this difference disappears when are compared subsets of the two groups of domicile matched funds that have the same liquidity or share restrictions (Joenväärä & Kosowski, 2014).

This aspect may cause that some investors, particularly those with a higher risk profile or wishing to invest in innovative alternative strategies, may choose to invest in hedge funds rather than in UCITS due to the lower value added by some UCITS.

Furthermore, UCITS funds, unlike hedge funds, with the aim of providing greater liquidity to investors, have to maintain a certain amount of cash, which reduces their efficiency. Also, that cash must be held in liquid form, as investors may want to subscribe or redeem units at any time, instead of being used to carry out investments aimed to achieve higher returns.

- **Higher correlation with the market**: Due to the lesser flexibility of UCITS funds compared to hedge funds, because of the large number of obligations that they must face, as well as to the various limits and restrictions that must be followed when making investments, the correlation of this type of investment vehicles and the market is usually greater than that of hedge funds, which seek to achieve absolute returns regardless of market conditions.

In addition and, due to the fact that UCITS must be focused on the preservation of the capital of investors, there is a large number of UCITS funds that are passively managed or, in other words, that try to replicate the performance of certain indexes, so the composition of the portfolios of these funds will be virtually identical to these indexes and, consequently, the correlation between the funds and the replicated indexes will be very high.

This aspect must be taken into account by all those investors who are planning to carry out investments in UCITS because, in those situations in which the market is in a bearish momentum and due to the lesser flexibility of this type of funds, it is quite likely that many of them may be negatively affected and, consequently, that investors may have certain losses.

- **High costs of the structures**: At the time of launching a particular UCITS and, as a consequence of the various obligations required by legislation, all those individuals that decide to launch one of these investment vehicles will need to face higher costs than those of other investment vehicles such as hedge funds.

In addition to the above mentioned, it must be noted that, for all those UCITS funds that do not have a certain volume of assets under management, maintenance costs of the structure are usually quite high, so this type of investment vehicles will be viable and sustainable in the future only if they have a certain level of assets under management.
- **High costs of some UCITS compared to other investment vehicles:** There is a large number of UCITS that are managed with the main objective of replicating the returns achieved by a given index or basket of securities. In these cases and, like other UCITS, they have a complex fee structure in which investors usually pay a management fee, as well as a performance fee if the fund has been able to outperform its benchmark, which does not always happen.

In this regard, the management fee that some UCITS funds typically charge to investors for simply replicating a particular index or basket of securities, may be seen as excessive when compared to the cost of other similar products, such as some ETFs, that are also able to replicate the returns of an index or a basket of securities but, however, with a much lower cost.

- **Low customization possibilities:** The portfolios of UCITS funds are usually built through the application of various techniques that are aimed to build diversified portfolios capable of achieving the objectives defined in the rules of the fund, and to protect the interests of investors.

However, there may be certain institutional investors or individuals with a high risk profile, who may disagree with various of the positions taken by the fund managers, either because the expected returns are not high enough, or because the risks taken are higher or lower than desired.

In these cases, the little control that investors have when deciding the positions of the portfolio may be seen as a disadvantage of UCITS funds compared to other products, such as managed accounts, in which investors have access to a professional and customized management according to the requirements and rules defined by themselves.

- **Not distributed in all countries:** UCITS, mainly due to their high prestige, may be purchased by investors in several non-EU countries that also allow their distribution to domestic investors, due to the robust and efficient legislation applicable to this type of products.

However, UCITS funds are not distributed in certain countries, so all investors based in these regions must choose to invest in other collective investment vehicles or, in other cases, to invest in UCITS indirectly through some other options that generally tend to be more expensive.

- **Competitive differences between UCITS:** UCITS may be structured in different ways, in the same way that they have the possibility to be established in any country of the European Union. This makes that most of UCITS are usually created in the most advantageous countries for the funds and their investors.

This aspect makes that UCITS funds that are based in countries in which the legislation is more advantageous, may have significant competitive advantages.
over other funds established in countries in which the advantages for the fund and its investors are lower. Due to this aspect, a great number of UCITS funds have decided to be established in countries such as Luxembourg or Ireland, due to their several advantages compared to other member states of the European Union. In this regard, it must be noted that recent studies concluded that “geography and domicile have a significant effect on fund performance and risk (Joenväääri and Kosowski, 2014)”.

The following charts shows the home countries chosen by UCITS compared to hedge funds.

- **Lesser alignment of interests between managers and investors:** In contrast to what happens in the case of hedge funds, portfolio managers of many of the
existing UCITS funds are not usually the founders of these funds, as well as that they do not usually invest a very high percentage of their personal wealth in the funds managed, which makes that the alignment of interests between managers and investors is usually lesser than in the case of hedge funds.

However, it should also be noted that, in recent years, member states have carried out various reforms in the regulations applicable to UCITS funds in order to promote a greater alignment of interests between managers of a particular fund and its investors. To achieve this, the legislation requires that the remuneration policy of management companies, investment companies, as well as of UCITS funds, must try to promote the achievement of objectives and attractive returns, while minimizing the risks taken.
3.4 STRATEGIES

UCITS funds, due to the several changes introduced in the legislation applicable to the industry, are able to implement different strategies in order to achieve the objectives defined in the rules of the fund. In this regard, UCITS may implement the same strategies than hedge funds, but only if those strategies are adapted to the requirements and limits contained in existing legislation, which were analyzed in detail in the section on the historical evolution of the UCITS industry.

The following figure shows the main strategies that are implemented by UCITS, as well as the importance of each strategy as of 2014.

![Chart 10: Importance of UCITS strategies as of 2014](chart)

Source: Compiled by author based on data from thehedgefundjournal.com

### 3.4.1 Long-only strategies

One of the several strategies used by UCITS funds, particularly by those that are non-sophisticated, are the so called long-only strategies. However, sophisticated UCITS can also implement these strategies.

In these strategies, the manager takes long positions, which are based on a thorough analysis, in undervalued assets that may increase in price in the future. Some of the

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several assets in which funds may invest are equities, fixed income, money market instruments, certain derivatives and, ultimately, all those instruments that, according to the existing legislation, are eligible and have a minimum level of liquidity.

These strategies are quite common in the UCITS fund industry, as there is a large number of such investment vehicles whose main objective is to replicate the performance of certain indexes. In these cases, the legislation requires that the indexes must have a diversified composition; be representative of the market; calculated in a suitable manner; have a minimum level of liquidity; as well as that they must be published and public, among other things.

In this type of strategies and, contrary to what happens in long/short strategies, managers take only long positions, which greatly facilitates the implementation of the strategy, since it is not necessary to find overvalued instruments and individuals willing to lend those assets. Moreover, in situations in which the market is in an uptrend, the returns achieved by the strategy will be higher, since there will be no short positions that may offset part of the returns achieved.

On the downside, these strategies may lead to losses in situations in which the market is in a downtrend, as the manager does not have any short positions aimed to achieve positive returns in a downtrend of the market or to hedge some of the risks of the long positions.

### 3.4.2 Long/short strategies

Long/short strategies are, like in the case of hedge funds, one of the favorites for many UCITS fund managers. These strategies, in contrast to the ones mentioned above, may only be implemented by sophisticated UCITS.

In this case, the manager will take long positions in those assets that are undervalued or showing high growth potential, and will sell short overvalued assets or that have problems that may endanger their price in the future.

Given the various limitations applicable to the UCITS funds when making investments, this strategy has to be adapted to any restrictions and limits in order to be implemented. In this regard, the manager must invest in those assets that are eligible and that have a minimum level of liquidity, while considering all applicable restrictions, including the ones affecting the fund's leverage. Also, since UCITS funds may not sell short, the manager must use certain derivative products in order to achieve the same effect as a short sale.
Usually, the derivative instruments used to replicate the effect of a short sale are contracts for differences (CFD) and SWAPS, the latter being the most common.

Contracts for differences are instruments agreed between two parties, a buyer and a seller, in which the seller agrees to pay the buyer the difference between the future price of the underlying, and the price of that underlying at the time of the agreement. In cases in which this difference is negative, the buyer will pay the difference to the seller. In this regard and, in order to replicate the effect of a particular short position, UCITS fund managers will be the selling party in CFDs, so they will make a profit as long as the future price of the underlying asset is lower than the price of that asset at the time of the agreement.

On the other hand, the swaps used by UCITS fund managers to replicate the effect of short positions are instruments in which a particular broker borrows shares, or other instrument, from a lender in order to then sell short these shares. Subsequently, the broker will deliver the funds obtained in the short sale to the lender as a collateral, who will invest these funds at a given interest rate, and that will pay the interest earned to the broker after deducting the cost of the loan or borrow rate. Then, the broker will pay to the UCITS the interest rate received from the lender less a fixed spread that it will charge to the UCITS. In addition, the broker will charge the fund an execution fee.

With this instrument, the broker will pay to the fund in those cases in which the price of the shares, or any other instrument used as underlying, decreases during the period, in the same way that the UCITS will pay to the broker the price increases, plus all the dividends or coupons distributed by the underlying during the period.

### 3.4.3 Market neutral strategies

Market neutral strategies are those in which UCITS fund managers take long and short positions that are aimed to maintain a neutral position in terms of market risk or, in other words, in which try to build diversified portfolios with a very low correlation with the market.

To implement these strategies, UCITS managers use certain derivatives products, so they may only be implemented by sophisticated UCITS funds. Also, the strategies must be adapted to the limits and requirements included in the applicable regulation.

### 3.4.4 Event driven strategies

Some UCITS may choose to implement event driven strategies that try to take advantage of opportunities that may arise in certain corporate events, such as mergers,
acquisitions, restructurings, recapitalizations, bankruptcies, and ultimately, any action or corporate transaction that may produce inefficiencies in the prices of certain instruments.

When implementing these strategies, managers must consider the limits and obligations included in the existing legislation, and sometimes they have to use derivatives, so they may only be implemented by sophisticated UCITS. In this regard, it must be said that some studies concluded that event driven strategies “are considered the most difficult strategy to restructure as UCITS (Amenc & Sender, 2010)”.

In addition, and in those cases in which managers are actively involved in a transaction in order to influence its outcome, they have to consider the different restrictions applicable to the maximum number of voting rights that they are allowed to have.

3.4.5 Fixed income arbitrage strategies

Certain UCITS specialize in all those strategies aimed to take advantage of opportunities that may arise as a result of inefficiencies in the prices of certain fixed income instruments. Usually, the managers of such funds try to minimize the interest rate risk of their positions by taking opposite positions that minimize such risks taken.

As in many of the cases analyzed previously, in order to implement these strategies, managers must consider all the limits and restrictions imposed by the legislation. Also, they usually need to use various derivative instruments, so that these strategies are often implemented only by sophisticated UCITS.

3.4.6 Convertible bond arbitrage strategies

There is also a large number of UCITS funds that implement strategies that are aimed to take advantage of the opportunities that may arise in certain issues of convertible bonds.

In this regard, all the funds wishing to implement such strategies will need to consider the restrictions and limitations included in the applicable law, as well as the use of different derivative products to implement them, so only sophisticated UCITS may carry out them.

3.4.7 Global macro strategies

Global macro strategies are those in which managers make directional bets in those assets that they believe will behave in a certain way in the future based on a thorough
analysis of various macroeconomic variables of a country, countries, or of the global economy as a whole.

These strategies, as it was mentioned before, are carried out by taking long or short positions in certain assets, usually currencies. Therefore, UCITS fund managers wishing to implement such strategies must adapt to the requirements, limits and obligations required by current legislation to this type of investment vehicles. In addition, and in some cases, in order to implement these strategies they may have to use derivatives in order to replicate the effect of short sales, so these strategies only will be implemented by sophisticated UCITS.

3.4.8 Managed futures
As in the case of some hedge funds, certain UCITS may carry out quantitative and systematic strategies in a great number of futures contracts on various assets and markets worldwide. In this regard, funds often have different algorithms and proprietary trading systems that are aimed to the construction of diversified portfolios, through which they try to take advantage of potential opportunities that may arise in these instruments.

Within all these strategies, there are some UCITS funds that seek to take advantage of opportunities that may arise in the commodity markets, or in currencies from around the world. In these cases, funds take positions in futures, or in other derivatives, in which the underlying is a given commodity or currency, or even a basket of commodities or currencies.

Just as in previous cases, in order to implement these strategies, UCITS funds must adapt their algorithms and trading systems to the limitations and restrictions contained in the applicable legislation. However and, in this regard, it must be noted that some studies concluded that “there are elements of the UCITS regulation such as prohibition on commodities investment outside of indices that particularly impact CTA managers (Darolles, 2014)”.

3.4.9 Distressed securities
In recent years and, due to the appetite of a large number of investors, several UCITS that specialize in distressed securities strategies have been created in order to take advantage of opportunities that may arise in these instruments, which are all those equity or fixed income securities of certain issuers that are in a difficult situation.
However, it is noteworthy that, due to the various limitations and restrictions imposed by the regulation applicable to the UCITS industry, the implementation of these strategies is often quite complicated, since the vast majority of these securities do not have the minimum liquidity level required by legislation to UCITS.

On the other hand, it must be said that sometimes, to implement these strategies, managers have to use various derivative instruments, so that many of the UCITS that specialize in distressed securities strategies are often sophisticated.

### 3.4.10 Emerging markets

In recent years, several UCITS funds have been launched in order to take advantage of opportunities that may arise in various instruments from emerging markets, due to the growing interest of a large number of investors from around the world in these countries.

However, and just as it happens in distressed securities strategies, the low level of liquidity that usually tend to have many instruments from emerging markets, is a great disadvantage for the implementation of these strategies, as there are several restrictions and limitations included in the legislation that must be considered by UCITS when carrying out their investments.

Also, UCITS funds that carry out strategies in emerging markets tend to use different derivative products, so that this type of strategies are often implemented only by sophisticated UCITS.

### 3.4.11 Other strategies

As in the case of hedge funds, UCITS funds have some flexibility to implement many other different strategies than those previously discussed, in order to exploit potential opportunities that may arise in certain assets and markets from around the world. Usually, many of these strategies require certain derivative products to be implemented, so that all of them will be restricted to sophisticated UCITS.

In this regard, it must be said that, when implementing all the alternative strategies that may be carried out by UCITS, the only requirement that must be met is the fact that these strategies have to be adapted to the several limits, restrictions and obligations included in the legislation applicable to this type of investment vehicles.
3.4.12 UCITS funds of funds

In recent years, it has been a considerable growth of UCITS funds of funds. These investment vehicles, instead of implementing strategies by themselves, make investments in other funds, usually UCITS, after having analyzed them in depth.

An example of a UCITS fund of funds structure is shown in the following figure.

![Figure 34: UCITS funds of funds example](source: Compiled by author)

As in all the strategies analyzed above, when making investments in other investment vehicles, the managers of UCITS funds of funds must consider the various limits, restrictions and obligations included in the current regulation.

On the other hand, it should also be noted that the legislation applicable to the investments that may carry out UCITS funds of funds includes various specific requirements for this type of investment vehicles, among which are aspects such as the possibility that they have to invest up to the 20% of their assets under management in a single UCITS, thus allowing them to concentrate some of their investments; as well as to carry out investments up to the 10% of their assets managed in other unregulated vehicles, such as hedge funds, among others.

Finally, it must be noted that there are certain multi-strategy UCITS that implement a combination of several of the strategies analyzed so far. However and, as in the case of certain multi-strategy hedge funds, these funds are only those that have a volume of assets under management high enough to employ large teams specialized in various strategies.
3.5 UCITS: AN EXAMPLE

After having analyzed the main characteristics, historical evolution, advantages and disadvantages, as well as the main strategies implemented by UCITS funds, it is time to analyze one of these investment vehicles. In this regard, the investment vehicle analyzed will be “UBS (Lux) Key Selection SICAV - European Core Equities (EUR) P-acc\textsuperscript{176}” (ISIN: LU0153925689), which is in turn a compartment or sub-fund of the SICAV “UBS (Lux) Key Selection”.

Among the main aspects that must be considered by all those investors who choose to invest in this product, which are included in the fund's brochure, fact sheet and key investor information document\textsuperscript{177}, are the following:

3.5.1 Management and administration

The fund is registered in Luxembourg, due to the several tax advantages that the country offers to funds and to investors compared to other member states of the European Union. Also, its management company is "UBS Fund Management Luxembourg", which is also based in Luxemburg and that belongs to the global banking group UBS. In this regard, the management company's main objective is to manage several investment vehicles according to the existing regulation of the country, as well as to issue or to redeem units of the different products managed.

On the other hand, the depositary and the administrator of the investment vehicle is UBS Luxembourg; while the independent auditor is Ernst & Young, one of the most prestigious professional services firms in the world.

The investment vehicle has an umbrella structure, and it is divided into several compartments or sub-funds that offer different classes of units that are targeted to investors with different risk profiles and characteristics. All these compartments are managed according to various strategies that try to exploit opportunities in several assets and markets worldwide. In addition, investors have the ability to switch from one compartment, or from a certain class of unit, to another at any time. In this regard, the sub-fund analyzed, which is called "European Core Equities (EUR)", is suitable for those investors who have a long term investment horizon and who wish to invest in a

\textsuperscript{176} Class P shares have an issue price of 100 euros, although they are also offered in other currencies, and are available to all investors.

\textsuperscript{177} You can access to all the documentation of the fund free of charge through the UBS’ website at the following link:
diversified portfolio of European equities, as well as in certain fixed income instruments.

3.5.2 Investment policy

The compartment analyzed is denominated in euros and its main objective is to invest primarily in equity securities of the major existing companies in Europe although, however, it may also carry out investments in other assets that are considered as eligible by the applicable law. In this regard, the fund must invest at least two thirds of its assets in equity securities of companies domiciled or with a significant level of activity in Europe. In addition, the income obtained by each of the 11 classes of shares of the investment vehicle are reinvested in the strategy. Also, it must be noted that the benchmark of the fund is the "MSCI Europe Index".

When deciding in which securities to invest, the managers of the fund, in order to determine the most attractive opportunities existing at a given time, base their decisions in the deep fundamental analysis carried out by several analysts that are specialized in the different industries in which the fund invests. In this regard, the fund invests in companies that operate in various industries and countries, and its main objective is to achieve interesting returns, while assuming a relatively low level of risk. This last aspect is very important, since managers have to maintain at all times a diversified portfolio in terms of markets, issuers, industries and countries.

Moreover, all the investments are carried out in those currencies that are most favorable for the interests of the fund's investors, which may be different of the currency in which the investment vehicle is denominated and in which it is calculated the NAV.

Among the different countries in which the fund currently has investments, it must be said that the UK is the country in which the fund has invested the most of its assets, followed by Switzerland and France. Also and, in terms of industry sectors, the fund has invested the largest percentage of its assets in financial services, healthcare and in industrial companies.

Moreover, it must be said that the fund has daily liquidity, as investors have the ability to subscribe or to redeem fund units every business day.
3.5.3 Performance and other statistics

The performance of the Class P shares net of fees, as well as the returns achieved by the fund benchmark (MSCI Europe), are shown below. In addition, it is also included a comparison between the performance of the fund and the returns achieved by its peer group.

As can be seen, the fund has achieved a very attractive annualized return over recent years, but however it has not been able to outperform its benchmark. Also, the fund is included in the third quartile or, in other words, within the best 75% of all the funds that belong to its peer group.

178 The performance data, as well as other statistics, are included in the fund fact sheet.
On the other hand, the main statistics of the fund are shown in the following table:

<table>
<thead>
<tr>
<th></th>
<th>3 years</th>
<th>5 years</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Beta</strong></td>
<td>0.95</td>
<td>1.05</td>
</tr>
<tr>
<td><strong>Volatility</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Fund</td>
<td>9.13%</td>
<td>12.80%</td>
</tr>
<tr>
<td>- Reference Index</td>
<td>9.00%</td>
<td>11.76%</td>
</tr>
<tr>
<td><strong>Sharpe ratio</strong></td>
<td>1.41</td>
<td>0.53</td>
</tr>
<tr>
<td><strong>Risk free rate</strong></td>
<td>0.23%</td>
<td>0.47%</td>
</tr>
</tbody>
</table>

As reflected in the above table, the fund has had a low volatility if compared with the returns achieved by the strategy, and very similar to that obtained by the benchmark. In addition, the beta of the fund stood at a level close to 1, thus indicating that the volatility or risk of the fund has been very similar to the volatility of the market or, in other words, that the portfolio has had a high correlation with the market.

On the other hand, the Sharpe ratio is a measure of risk-adjusted return that is used to compare the performance of funds. This metric, which will be analyzed in more detail in the next chapter, is calculated as the ratio between the excess expected return of the portfolio over the risk-free rate and the standard deviation of the portfolio. In a comparison, the fund with the higher Sharpe ratio will be the better, since this metric measures the excess return achieved by a given fund for each unit of volatility or risk taken. In other words, a fund with a higher Sharpe ratio achieves a higher return for the same level of risk assumed or, from another point of view, the same return with the lower risk taken. In this regard, the 3-year Sharpe ratio of the fund has been high, but it should be compared with that obtained by its homologous funds before reaching any conclusions.

### 3.5.4 Fee structure

The compartment has several costs that must be considered, among which are the following:
On the one hand, there are non-recurring costs or, in other words, costs that are paid by investors before or after their investments, but not annually, which are divided between entry costs, exit costs and conversion costs. Among them, the entry costs are set at a maximum of a 3% applicable to the funds invested in the product, while conversion costs are set at a maximum of a 3%, but in this case are applied only in those moments in which an investor decides to switch from a compartment or class of unit to another. However, it must be said that the entry costs and the conversion costs vary according to investors. Also, the fund has no exit costs or, in other words, investors do not have to pay anything if they decide to amortize or sell the fund units.

On the other hand, the main current expenditure that investors have to pay each year is the management fee, which is set at a 1.63% in the case of the share class P. In addition, it must be highlighted the fact that the fund has no performance fee.

Finally, and along with the various aspects mentioned above, it must be noted that the total expense ratio (TER) of the fund, which is defined as the ratio between the total costs of the fund and its assets under management, is approximately a 2.1%.

3.5.5 Risks

All the investors that are planning to invest in the fund have to consider several risks, as well as various limitations and restrictions contained in the applicable law that must be considered by the fund when investing. In this regard, the restrictions and limitations contained in the legislation applicable to the UCITS industry affect to several aspects, such as to the use of derivatives; investments in eligible assets; minimum liquidity levels required to assets; investments in emerging countries; procedures and risk management mechanisms; as well as to the use of leverage, among others.

On the other hand, the fund poses several risks for investors, among which are included market risk; credit risk; idiosyncratic risk; model risk; as well as operational risk. In addition, and unlike other investment vehicles, the fund does not pose a high liquidity risk, due to the restrictions and obligations contained in the applicable law, nor a high country risk, since the compartment has an investment universe that is restricted exclusively to Europe.

The fund risk category within the scale used in the UCITS fund industry is set at a 6 out of 7, since the variation of returns is very high or, in other words, the fund has a high risk and also a high potential return. Finally, it must be said that the risk category of the fund has a dynamic character, as it can change over time, and it is determined as an estimate of the future volatility of the investment vehicle, for which historical data of its volatility are used.
4. QUANTITATIVE ANALYSIS

4.1 INITIAL CONSIDERATIONS

In this chapter, a comparison between the main indexes of hedge funds and UCITS will be conducted, in order to determine which ones have had a better performance over recent years. However, and before performing the comparison, it is essential to know in detail the several metrics that will be used, as well as certain aspects of the databases used in the analysis.

4.1.1 Performance and risk statistics

This section includes the definitions\textsuperscript{179} of the main metrics used to measure the performance, as well as the risks, of the indexes analyzed. In this regard, it must be noted that the following variables have been used in the formulas included in this section. In those cases in which a given formula requires a specific variable in order to be calculated, a brief description of the variable will be given.

- “Xi”= Observation “i” of a variable X
- “Yi”= Observation “i” of a variable Y.
- “n”= Number of observations of a sample.
- “N”= Number of observations of a population.
- “wi”= Weight of the observation “i” within the sample.
- “X”= Arithmetic mean of a variable X.
- “Y”= Arithmetic mean of a variable Y.
- “σ”= Population standard deviation.
- “s”= Sample standard deviation.
- “Rp”= Return achieved by the portfolio or fund.
- “Rb”= Return achieved by the benchmark of a fund.
- “Ri”= Return achieved by a given asset/instrument.

Ethical and Professional Standards and Quantitative Methods, CFA Level I Curriculum, CFA Institute, 2014.
-“Rm”= Return achieved by the market (usually S&P 500).

4.1.1.1 Mean

The mean is one of the most used metrics in any statistical analysis, thanks in part to its ease of calculation. It is included within the statistics known as measures of central tendency, which are aimed to determine where the data analyzed are centered. There are four types of mean: arithmetic; weighted average; geometric; and harmonic.

The arithmetic mean is the simplest and most used mean. It is used by analysts as a measure of the typical performance/returns of a certain financial instrument. Furthermore, all the possible deviations from the mean are considered a risk. It is calculated as the sum of all the observations, divided by the number of observations. In addition, it can be calculated for both a population, as for a sample, using the following expressions.

\[
\mu = \frac{1}{N} \sum_{i=1}^{N} x_i \\
\bar{x} = \frac{1}{n} \sum_{i=1}^{n} x_i
\]

[1]

Finally, it must be noted that the main advantages of the mean compared to other measures of central tendency, such as the mode or the median, are that it considers the scale and the size of the observations, as well as its ease of calculation.

The weighted average is also one of the most used statistics in financial analysis, particularly when trying to analyze the returns achieved by a given portfolio composed of several assets. It is calculated as the sum of each of the observations, multiplied by its weight. Furthermore, the sum of all the weights must be equal to one. In other words, while the arithmetic mean assumes that the weights of all the observations are equal, the weighted average assumes that the relative importance or weight of each of the different observations varies. The following formula shows how to calculate the weighted average.

\[
\bar{X}_w = \sum_{i=1}^{n} w_i X_i
\]

\[
\sum_{i} w_i = 1
\]

[2]
Finally, it must be said that, when calculating the weighted average of a given portfolio composed of long and short positions, the weights of long positions will be positive, while the weights of short positions will be negative.

The geometric mean is a statistical used for averaging the rates of change over a specified period of time, as well as to calculate the growth rate of a given variable. For data other than returns, the geometric mean is calculated as the nth root of the product of all the individual observations, as shown below.

\[
\bar{x}_{\text{geom}} = \sqrt[n]{\prod_{i=1}^{n} x_i} = \sqrt[n]{x_1 \cdot x_2 \cdot \ldots \cdot x_n}
\]  

[3]

However, in financial analysis, the geometric mean is usually used to calculate the compounded returns achieved by a given instrument over a period of time. In cases in which the data used are returns, analysts use the following expression.

\[
\bar{x}_{\text{geom}} = \sqrt[n]{\prod_{i=1}^{n} R_i} - 1
\]

[4]

The harmonic mean is the least used mean, although it has some applications. In order to calculate it, first the analyst must calculate the reciprocal values (1/Xi) of the different observations to then sum all the reciprocal values. Finally, the number of observations must be divided by the sum previously calculated. The following equation shows how to calculate the harmonic mean.

\[
\bar{X}_{HH} = \frac{1}{n} \sum_{i=1}^{n} \frac{1}{X_i}
\]

with \(X_i > 0\) for \(i = 1, 2, \ldots, n\)

[5]
4.1.1.2 Median

The median is also one of the most used measures of central tendency. It is defined as the value of the observation located at the center of a given set of observations that have been previously sorted. If the number of observations is odd, there will be only one median that will be the value of the observation located in the position (n+1)/2. On the other hand, if the number of observations is even, there will be two medians, which will be the values of the observations located in the positions n/2 and (n+2)/2.

The main advantage of the median compared to the mean is the fact that it is not affected by extreme values, but however it does not use all the information of the size and magnitude of the observations, as it focuses exclusively on the relative position of the different observations previously sorted. In addition, its calculation is complex, as it requires to sort the observations, as well as to determine if the number of observations is odd or even.

4.1.1.3 Mode

The third of the most important measures of central tendency is the mode, which is defined as the value that appears most often in a given set of observations. In this regard, it must be noted that in a certain distribution may be one mode, several modes, or no mode. If the distribution has only one mode, it will be considered as unimodal; if it has two, it will be bimodal; if it has three, trimodal; and so on. In addition, and in those cases in which a distribution is divided into different intervals, it will be one, none, or several modal intervals.

Finally, it must be said that the mode is the only measure of central tendency that may be used with nominal data.

4.1.1.4 Average gains/losses

On certain occasions and, in order to attract a greater number of investors, funds typically calculate their average gains and their average losses.

Average gains are calculated as the sum of the positive returns achieved by the fund, divided by the number of periods in which the fund achieved a positive return. In other words, it is the arithmetic mean of the positive returns.

On the other hand, the average loss is calculated as the sum of the negative returns, or losses, achieved in a given period, divided by the number of periods in which the fund achieved losses. In other words, it is the arithmetic mean of the negative returns.
Once calculated the average gains and the average losses, funds may also calculate the so called gain-to-loss ratio, which is defined as the ratio between average gains and average losses, the latter in absolute value. If the ratio is greater than one, it indicates that, on average, the gains outweighed the losses, while if it is lower than one, it indicates that, on average, the losses outweighed the gains. However, it must be clarified that this ratio does not provide any information on the number of positive and negative periods, in the same way that it does not take into account the effect of compounding.

### 4.1.1.5 Quartiles, quintiles, deciles and percentiles

Along with the different measures of central tendency analyzed so far, there are location measures that are used to determine the value below which a certain percentage of the observations lie. Quartiles, deciles, quintiles and percentiles, are used to divide a given dataset previously ordered in ascending order. In this regard, quartiles divide the distributions into four parts; quintiles into 5; deciles into 10; and percentiles into 100 equal parts.

The most common ones of all of them are percentiles. In mathematical terms, the ‘i-th’ percentile indicates the value below which the “i%” of the observations lie. For example, the 10th percentile divides the distribution such that the 10% of the observations lie below it.

When determining the value of a certain percentile, it must be approximated since, usually, it is quite complicated to find a certain value able to divide the distribution such that a certain percentage “y” of the observations lie below it. The formula used to this approximation is shown below.

\[
I_y = (n + 1) \frac{y}{100}
\]

In practical terms, quartiles and percentiles are often used to rank the performance of the managers of certain funds within their peer group, as well as to perform different analysis of several economic variables.

### 4.1.1.6 Range

The range is a measure of dispersion defined as the difference between the maximum value and the minimum value of a given data set, as shown below.
Its main advantage is the fact that its calculation is very simple. However, it has some disadvantages, such as that it only considers two data of the distribution; it does not indicate the manner in which data are distributed, or in other words, the shape of the distribution; and that, as a result of considering only the maximum and the minimum value of the distribution, it may reflect results that may not be representative of the distribution.

4.1.1.7 Variance and standard deviation

The variance and the standard deviation are the main and most used measures of dispersion. Unlike the range, the variance and the standard deviation are calculated by using all the observations of a given distribution, instead of using only the minimum and the maximum value.

The first of the different risk statistics that may be calculated is the mean absolute deviation or MAD, which is calculated as the sum of all the absolute deviations from the mean, divided by the number of observations. In other words, it measures the average distance between each observation and the mean. In this regard, the deviations must be calculated in absolute value since, otherwise, the sum of all the deviations will be equal to zero.

The main positive aspect of this statistic compared to the range is that it uses all the observations of the distribution. However, it is more difficult to manipulate it mathematically compared with the variance and with the standard deviation. The following expression shows the way of calculation of the MAD.

\[
\text{MAD} = \frac{\sum_{i=1}^{n} |x_i - \bar{x}|}{n}
\]

On the other hand, the variance, which can be calculated for a population or a sample, is defined as the average of the different deviations around the mean, all of them squared. By calculating the squared deviations, it is avoided the problem that the sum of all the deviations around the mean is equal to zero. The variance is calculated by using the following expressions.
As reflected in the above expressions, in the calculation of the variance, the deviations around the mean have been squared, so it will be necessary to return them to their original units. To solve this problem, analysts calculate the standard deviation, which is defined as the square root of the variance. The standard deviation is easier to interpret than the variance, since it is measured in the same units as the observations. Also and, as in the case of the variance, the standard deviation may be calculated for a population and for a sample by using the following expressions.

\[
\text{Population Variance} = (\sigma x)^2 = \frac{1}{n} \sum_{i=1}^{n} (x_i - \bar{x})^2
\]
\[
\text{Sample Variance} = (Sx)^2 = \frac{1}{n-1} \sum_{i=1}^{n} (x_i - \bar{x})^2
\]

As referred to previously, due to the impossibility to know or identify all the members of a given population, the variance and the standard deviation are often calculated using a sample of the population. In this regard, the variance and the standard deviation of a sample are the most used measures of volatility or risk by financial analysts.

4.1.1.8 Semi-variance and semi-deviation

As it was mentioned above, the variance and the standard deviation of the returns of a financial instrument use the returns that are above and below the mean. However, investors are usually more interested in the returns that are below the mean, as these returns indicate the risk of the instrument of having losses.

The semi-variance and the semi-deviation consider exclusively the returns that are below the mean. In this regard, the semi-variance is defined as the average of the deviations that are below the mean, all of them squared; while the semi-deviation is calculated as the square root of the semi-variance. The following expressions show the calculation formula of both metrics.
However, it must be said that, in practice, investors are usually interested in the returns of a financial instrument that are below a certain level or target return, which usually tends to be different from the mean. In these cases, they will calculate the semi-variance below target and the semi-deviation below target. The following formulas show the way of calculation of both metrics, where "B" = target return.

\[
\text{Semi-Variance Below Mean} = \frac{\sum (X_i - \bar{X})^2}{(n-1)}
\]

\[
\text{for all } X_i \leq \bar{X}
\]

\[
\text{Semi-STD Below Mean} = \sqrt{\text{Semi-Variance Below Mean}}
\]

\[
\text{Semi-Variance Below Target} = \frac{\sum (X_i - B)^2}{(n-1)}
\]

\[
\text{for all } X_i \leq B
\]

\[
\text{Semi-STD Below Target} = \sqrt{\text{Semi-Variance Below Target}}
\]

4.1.1.9 Skewness

Another aspect that is usually analyzed in a given probability distribution of a random variable is the degree of symmetry around its mean. In finance, the observations of a distribution are usually the returns achieved by a particular financial instrument. In this regard, if a distribution is symmetric, both sides of the distribution will be equal, while if it is skewed, both sides will be different.

In the cases of skewed distributions, the skew may be positive or negative. A positive skew indicates that the instrument has frequent small losses and a few large or extreme gains. On the other hand, a negative skew indicates that the instrument has frequent small gains and a few large or extreme losses. In other words, a distribution with a positive skew will have a long tail on the right side, while a distribution with a negative skew will have a long tail on the left side, as shown in the following examples.
Usually, investors are interested in positively skewed distributions, since the average returns are above the mean. Furthermore, the losses will be limited to small amounts, although frequent.

To determine whether a distribution is symmetrical or asymmetrical, analysts calculate the skewness coefficient by using the following expression.

\[ S_K = \frac{\sum_{i=1}^{n} (X_i - \bar{X})^3}{s^3} \]  

[13]

If the skewness coefficient is positive, the distribution will be positively skewed, while if it is negative, the distribution will be negatively skewed. Also, if the skewness coefficient is zero, the distribution will be symmetrical.

**4.1.1.10 Kurtosis**

Kurtosis is a statistic that measures the shape of a distribution compared to the normal distribution. In other words, it indicates whether the shape of a distribution is more or less peaked than the shape of a normal distribution. Depending on its shape compared to the normal distribution, the distribution will be leptokurtic, platykurtic or mesokurtic.
The following expression is the sample excess kurtosis formula, which is used to calculate the excess kurtosis of a distribution.

\[
K_e = \left( \frac{n(n+1)}{(n-1)(n-2)(n-3)} \frac{\sum_{i=1}^{n}(X_i - \bar{X})^4}{s^4} \right) - \frac{3(n-1)^2}{(n-2)(n-3)}
\]

If the excess kurtosis coefficient is zero, the distribution will be mesokurtic. The most common example of a mesokurtic distribution is the normal distribution. If, however, the excess kurtosis coefficient is positive, the distribution will be leptokurtic. In this case, the shape of the distribution will be more peaked than the shape of the normal distribution. Finally, if the excess kurtosis coefficient is negative, the distribution will be platykurtic. In this case, the shape of the distribution will be less peaked than the shape of the normal distribution. The following figures show the different types of distributions graphically.

**Figure 38: Examples of a mesokurtic, leptokurtic and platykurtic distribution**

![Mesokurtic (Normal), Leptokurtic, Platykurtic Distributions](source)

Source: Compiled by author

### 4.1.1.11 Maximum drawdown

Investors tend to be concerned at all times about the possible falls that may have a given financial instrument, being this aspect particularly relevant in the case of investment funds. The maximum drawdown is a widely used measure that indicates the maximum loss that a particular investor would have had if he would have decided to carry out an investment in the fund over a specified period of time.
In addition, and along with the maximum drawdown, funds usually calculate the recovery time of such loss or, in other words, the time that it takes to recover the NAV level that it had before the loss.

The main advantage of this statistic lies in its ease of calculation and interpretation by any type of investor. On the other hand, the main problems are that this metric is very sensitive to the frequency of the data used in the analysis, so that the maximum drawdown will be greater the lower the frequency of the data used; in the same way that it is also very sensitive to the time period used in the analysis, so that the maximum drawdown will be greater the longer the time period analyzed, which greatly impacts to the funds with longer track records.

4.1.1.12 Value at risk (VaR)

VaR is one of the most used statistical measures to determine the risk of a given portfolio or firm. It is defined as the maximum loss that is expected to have the portfolio (or company) over a period of time and for a given confidence level. For example, if a given portfolio has a 1-day VaR of 1 million USD, with a confidence level of a 95%, it indicates that 1 in every 20 days (or a 5% of the time), the expected loss will be higher than a million USD. In other words, there is a 5% chance that the portfolio may have a loss in excess of 1 million USD in one day. However, it must be said that the VaR is usually expressed in relative terms, i.e. it usually indicates the percentage of maximum expected loss, to facilitate comparisons between portfolios. In this regard, it must be said that recent studies concluded that “VaR based measures are superior to traditional risk measures like standard deviation of returns and leverage ratios, in capturing hedge fund risk, since standard deviation measures understate risk and are inappropriate for hedge funds, due to the fact that their returns exhibit significantly high kurtosis (Gupta & Liang, 2004)”.

The problem with this metric is that it does not provide any information about how large will be the loss in the moments in which losses are higher than the maximum expected loss. Therefore, the VaR is usually calculated along with the CVaR or conditional VaR, which is an indicator of risk that determines, for a given probability level (typically a 5%), the expected loss of a given portfolio or company in the worst % of the cases.

To calculate the VaR (or CVaR), analysts often use complex mathematical methods such as historical simulations or Monte Carlo methods, which are beyond the scope of this analysis.
4.1.1.13 Covariance

The covariance is a statistical measure of how much two random variables change together. In other words, it tries to quantify the linear relationship between two variables. In finance, it is widely used with data of returns achieved by two financial instruments. In these cases, the covariance indicates whether the returns achieved by both financial instruments move together or not.

If the covariance between the returns achieved by two financial assets is zero, the instruments will be independent or, in other words, will not move together. If it is positive, both assets will move in the same direction. Finally, if the covariance is negative, both assets will move in opposite directions. For its calculation, it is usually used the following expression.

\[
\text{COV}(X,Y) = \frac{\sum_{i=1}^{n} (X_i - \bar{X})(Y_i - \bar{Y})}{n-1}
\]

4.1.1.14 Correlation

The correlation is one of the statistics most used by financial analysts. It is usually measured by the correlation coefficient, which tries to determine the extent, or degree, to which the movements of a given variable are associated with another variable. In mathematical terms, it is defined as the ratio of the covariance between the two variables and the product of standard deviations, as shown in the following expression.

\[
\text{corr}(X,Y) = \frac{\text{COV}(X,Y)}{S_x S_y}
\]

The correlation coefficient takes values between -1 and 1. If it is equal to zero, the variables will be independent; if it is between 0 and 1, there will be a positive correlation; whereas if it takes a value between 0 and -1, the correlation will be negative. Furthermore, if the correlation is equal to 1, it will indicate that both assets will move in the same direction and in the same amount; in the same way that, if it is equal to -1, it will indicate that both assets will move in opposite directions and in the same amount.
4.1.1.15 Beta

The non-diversifiable risk or market risk is one of the main problems that investors face in their investments. This risk is measured by the statistic known as beta, which is calculated as the covariance between market returns and the returns of the asset analyzed, divided by the variance of market returns, as shown in the following formula.

\[ \beta_i = \frac{Cov(R_i, R_m)}{Var(R_m)} \]  \hspace{1cm} \text{[17]} \]

If the beta of an asset is equal to 1, it indicates that the asset price will move with the market; if it is greater than one, the asset price will move more than the market and will have a higher risk (it will be more volatile than the market); in the same way that if the beta of the asset is lower than one, the asset price will move less than the market and will have a lower risk (it will be less volatile than the market). If, for example, the beta of a given stock is equal to 1.15, it indicates that for each 1% that the market moves, the stock will move a 1.15% or, in other words, the stock will be a 15% more volatile than the market.

Usually, shares of high growth companies have a beta greater than 1, while shares of mature companies have betas that are lower than one. Moreover, if the beta of an asset is negative, the asset will move in the opposite direction to the market. This may happen on occasion in some assets, such as gold, although it is not common.

4.1.1.16 Tracking error

The tracking error is a statistic that is widely used by those investment funds that seek to replicate the performance of a given benchmark. It measures the difference between the returns achieved by the fund and the returns achieved by its benchmark. There are several ways to calculate the tracking error, being very common the following expression.

\[ TE = \sqrt{\frac{\sum_{t=1}^{n}(R_t - R_b)^2}{n-1}} \]  \hspace{1cm} \text{[18]} \]

When carrying out their investments, investors usually choose those funds that have the lower tracking error or, in other words, that are able to replicate the performance of their
benchmarks in the most accurate way. In this regard, if the tracking error is positive, it indicates that the fund has been able to outperform its benchmark; if it is negative, it indicates that the fund was not able to outperform its benchmark; while if it is zero, it indicates that the fund achieved the same return as its benchmark.

Finally, it must be noted that the tracking error may be calculated ex-ante, using data of estimated returns; or ex-post, using data of returns achieved by the portfolio or fund, and of the market. In this regard, it must be said that certain studies show that “fund managers always have a higher ex-post tracking error than their planned tracking error, so any performance fee based on ex-post tracking error is unfavorable to fund managers (Hwang & Satchell, 2001)”.

### 4.1.1.17 Other benchmark-related statistics

As a consequence of the large number of investment funds that seek to replicate the behavior of a given benchmark, analysts have developed several metrics that try to compare the performance of the funds with their benchmarks, in order to enable investors to select the most successful funds in the simplest way. In this regard, it must be said that there are many benchmark-related metrics, although not all of the metrics are calculated by certain funds, in the same way that sometimes their interpretation is not easy for investors.

Some of the calculated metrics are the number of periods in which the fund has been able to outperform its benchmark; the ratio between the periods in which the fund had losses and the total periods; as well as the ratio between the number of periods in which the fund achieved positive returns and the periods in which the benchmark achieved positive returns, among others.

### 4.1.2 Risk-adjusted performance measures

This section includes definitions\(^{180}\) of the main risk-adjusted performance measures used when analyzing the performance of funds. In this regard, it must be said that there are a lot of metrics, thanks in part to several statistical and mathematical studies conducted in recent years. However, and to keep the study within acceptable limits, there are included only the most relevant and most used metrics. In this regard, the following variables have been used in the formulas included in this section. In those cases in which a given formula requires a specific variable in order to be calculated, a brief description of the variable will be given.

---

Ethical and Professional Standards and Quantitative Methods, CFA Level I Curriculum, CFA Institute, 2014  
- “Rp” = Return achieved by a given portfolio.
- “Rf” = Risk free rate.
- “Rb” = Return achieved by the benchmark of a given portfolio.
- “Rm” = Return achieved by the market (usually S&P 500).
- “σp” = Standard deviation (volatility) of a portfolio.
- “σm” = Standard deviation (volatility) of the market.
- “βp” = Beta of a portfolio.

### 4.1.2.1 Sharpe ratio

The Sharpe ratio\(^\text{181}\) is the main measure of risk-adjusted performance used by the leading investment funds in the world, mainly because of its ease of calculation and interpretation. It is calculated as the difference between the returns achieved by a given portfolio and the risk-free rate, all divided by the standard deviation of the portfolio, as shown in the following expression.

\[
\text{Sharpe Ratio} = \frac{R_p - R_f}{\sigma_p} \tag{[19]}
\]

In other words, the Sharpe ratio measures the excess return achieved by the portfolio over the risk-free rate per unit of risk taken. The higher the Sharpe ratio, the better the risk-adjusted return achieved by the portfolio.

Another aspect to consider is that this metric has some disadvantages, among which are included the fact that it is necessary to calculate the Sharpe ratios of the different portfolios analyzed in order to carry out a comparison; as well as that it considers the total risk of the portfolio, measured by the standard deviation, when investors are rewarded only by the non-diversifiable risk, among others.

Finally, it must be noted that the Sharpe ratio may be calculated ex-ante or ex-post depending on whether the data used are estimates or real returns achieved by the portfolio.

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4.1.2.2 Sortino ratio

The Sortino ratio is a measure of risk-adjusted performance that measures the risk not by the standard deviation of all the returns, but by the standard deviation of the returns that are below a certain level of acceptable return that, usually, is the risk-free rate. The main difference between the Sortino ratio and the Sharpe ratio lies in the fact that, while the Sharpe ratio penalizes the upward and downward volatility, the Sortino ratio penalizes only the downward volatility. In addition, it allows to define a certain minimum of acceptable return in its calculation.

The following equation shows the standard way of calculating the Sortino ratio, where "MAR" = minimum acceptable return; "DDp" = standard deviation of returns below the MAR.

\[
\text{Sortino ratio}_p = \frac{R_p - \text{MAR}}{DD_p}
\]  \[20\]

As in the case of the Sharpe ratio, the higher the Sortino ratio of a given fund compared with other funds, the better the fund. However, to carry out comparisons, the analyst must be sure that all the funds analyzed used the same minimum acceptable return in the calculation of their Sortino ratios.

4.1.2.3 Treynor ratio

One of the main drawbacks of the Sharpe ratio is the fact that in its calculation it considers both the diversifiable risk, as well as the non-diversifiable. The Treynor ratio was created to end with this problem, as it is defined as the difference between the returns achieved by a given portfolio and the risk-free rate, all divided by the beta of the portfolio. The following expression shows the formula used to calculate the Treynor ratio.

\[
\text{Treynor Ratio} = \frac{R_p - R_f}{\beta_p}
\]  \[21\]

In this case and, as the ratio uses as a measure of risk the beta of the portfolio rather than the standard deviation, it is considering exclusively the non-diversifiable or market
risk. However, it still has the problem that, in order to carry out comparisons, the analyst must calculate the Treynor ratios of the different portfolios analyzed, as well as it does not work in cases in which an asset has a negative beta.

On the other hand, it must be said that, as in the previous cases, the higher the Treynor ratio of a fund compared to other funds, the better, as it indicates that the fund achieved a higher return per unit of market risk.

### 4.1.2.4 Information ratio

The information ratio is another measure of risk-adjusted performance widely used by financial analysts. It is defined as the difference between the returns achieved by a given portfolio and the returns achieved by its benchmark, all divided by the tracking error, as shown in the following expression.

\[
Information\ Ratio = \frac{R_p - R_b}{TE}
\]  

[22]

As in the previous cases, investors tend to choose the funds with the higher information ratios compared to other comparable funds. In this regard, a fund will have a higher information ratio if the manager has been able to outperform his benchmark largely in a small number of periods, or if he was able to outperform his benchmark slightly in a large number of periods.

### 4.1.2.5 Jensen Alpha

The Jensen Alpha\(^{182}\) is also a widely used measure of risk-adjusted performance. In this case and, like the Treynor ratio, it measures the risk by the beta and not by the standard deviation of the portfolio. This metric allows analysts to evaluate the performance of a given portfolio compared to the market or, in other words, it indicates the excess return achieved by a given portfolio compared to its theoretical expected return. This theoretical expected return is calculated by using the CAPM model.

The following equation shows how to calculate the Jensen Alpha.

If the Jensen Alpha is positive, it indicates that the portfolio was able to achieve a higher than expected return, while if it is negative, it indicates that the portfolio performed worse than expected. In other words, if the Jensen Alpha is positive, the portfolio will have been able to beat the market, while if it is negative, the portfolio will have had a below-market performance.

When comparing different funds, the higher the Jensen Alpha, the better the fund. In addition, the value of the Jensen Alpha indicates the maximum amount that investors should be willing to pay the manager (or fund) to manage their money.

4.1.2.6 Calmar ratio

The Calmar ratio is a measure widely used by CTAs and hedge funds. It is defined as the ratio between the average annualized rate of return and the maximum drawdown of a given portfolio, the latter in absolute value. Generally, when calculating the ratio, analysts typically use a period of three years, but sometimes they may use longer periods. The formula used to calculate the ratio is shown below.

\[
\text{Calmar Ratio} = \frac{\text{Annualized ROR (last 3 years)}}{\text{Maximum Drawdown (last 3 years)}}
\]

As in the different measures of risk-adjusted performance analyzed so far, the higher the Calmar ratio of a given fund compared to other funds, the better the fund.

4.1.2.7 Omega ratio

The Omega ratio is also one of the measures of risk-adjusted performance widely used by hedge funds. It measures the probability of achieving a given target return, so that the higher the Omega ratio, the more likely will be the fund to reach or to exceed a certain target return. In mathematical terms, the Omega ratio is defined as the ratio between the cumulative probability of the outcome of an investment above a level of return defined by the investor, and the cumulative probability of the outcome of an investment below the target return defined by the investor.
The following formula, which has a high level of complexity, shows how to calculate the Omega ratio, where, "F(x) dx”= cumulative density function of returns; "r”= defined target return.

\[
\Omega = \frac{\int_{-\infty}^{r} 1 - F(x) \, dx}{\int_{-\infty}^{r} F(x) \, dx}
\]

[25]

Finally, it must be noted that the Omega ratio does not assume a normal distribution of returns. This aspect is important when analyzing the returns achieved by alternative investments, in which the risk is not properly described by the variance.

4.1.2.8 M\(^2\)

In recent years, there has also been extended the use of the M\(^2\) metric to analyze the risk-adjusted performance of certain funds. This metric and, like the Sharpe ratio, consider the total risk, so it will be an interesting metric to evaluate portfolios that are not sufficiently well diversified.

To calculate the metric, the analyst first have to build a portfolio that replicates all the market risks. Once done, it must be calculated the difference between the return achieved by the replicating portfolio and the return achieved by the market. This difference will be M\(^2\).

The following expression shows the calculation method of M\(^2\).

\[
M^2 = (R_p - R_f)\frac{\sigma_m}{\sigma_p} - (R_m - R_f)
\]

[26]

If $M^2$ is positive, it indicates that the portfolio has been able to beat the market; while if it is zero, it indicates that the portfolio achieved the same return than the market. When comparing different portfolios or funds, the higher the $M^2$, the better the fund.

Finally, it must be noted that the main advantage of $M^2$ compared to the Sharpe ratio lies in the fact that it is expressed in relative terms, so it is easier to be interpreted by investors when carrying out comparisons. If, for example, a portfolio has a $M^2$ of an 8% and another portfolio has a $M^2$ of an 8.5%, the investor is able to simply understand that the second portfolio achieves an additional 0.5% risk-adjusted return annually.

4.1.3 Biases of the databases used

The different databases used in the analysis carried out, have a number of problems that must be considered. In this regard, it is particularly important to know the main biases that present the different databases, due to several issues that will be discussed below. These biases are particularly relevant in the case of hedge fund databases.

4.1.3.1 Self-selection bias

The first of the main biases included in hedge fund databases is the self-selection bias. This bias refers to the fact that, usually, the returns achieved by hedge funds may contain inaccuracies because these investment vehicles are not required to report the returns achieved over a given period of time. This aspect contrasts with other collective investment vehicles that are obliged to distribute among investors all the information of the returns achieved by the strategies implemented.

The fact that hedge funds are the ones that decide whether to report their performance or not, tends to lead to a situation in which funds generally will report their performance only if it has been good, in the same way that, in those periods in which the funds have not behaved in an acceptable manner, they will choose not to report any information of the returns achieved. Therefore, there will be a large number of hedge funds that will not be included in the different databases for the simple reason that the report of information is done on a voluntary basis, thus creating a significant bias in all the databases.

Furthermore, it must be said that there will be a large number of funds, usually those with an established track record and with enough capacity to attract investors from around the world due to the talent of their managers, that will not report any information of the returns achieved by the strategies implemented simply because they do not want

to do it, or because managers choose not to do it in order to differentiate their investment vehicles from other funds of the industry. However and, in this regard, it must be said that recent studies concluded that “the true value of a hedge fund’s track record therefore appears not to lie in its use as a predictor of future performance and risk, but primarily in the insight that it provides in a fund's risk profile relative to that of other funds in the same strategy group (Kat & Menexe, 2002)”.

Finally, it must be noted that the self-selection bias included in the different databases of hedge funds may have a positive or negative impact, as there will be funds that will choose not to report the returns achieved because such returns have been low, in the same way that there will be others that will choose not to report any information about their strategies for the simple reason that they do not need it, or because they want to differentiate themselves from the industry, regardless of whether the returns achieved were positive or not. However, most of the funds that choose not to report their performance do it because their returns have been low, so that, in general, self-selection bias tends to negatively impact the data of hedge fund returns that are included in the different databases or, in other words, the returns of such databases tend to be higher (overestimated) than the real returns achieved by the industry. In this regard, it must be said that recent studies concluded that “investors in hedge funds take on a substantial risk of selecting a dismally performing fund or, worse, a failing one (Malkiel & Saha, 2005)”.

**4.1.3.2 Database/sample selection bias**

Another important bias that is often included in the different hedge fund databases is the database/sample selection bias. This bias refers to the fact that the databases are incomplete, as they do not include all the hedge funds of the industry, as well as that many of them establish a set of criteria that must be met by the funds in order to be included in the database, so there will be a large number of funds that will not be included simply because they do not meet the solicited requirements. In addition, hedge funds tend to report information only to one or two databases, in the same way that the statistics, as well as the different calculation methods used by the different databases, may be different.

Some of the requirements that must be met by hedge funds in order to be included in a database are that the track record must be audited and it must include at least a certain number of years, usually two years, although some databases require a 5-year track record; a minimum volume of assets under management, which is a problem for a large number of small-sized funds; as well as the implementation of certain investment strategies, among others.
4.1.3.3 Survivorship bias

On occasion, some hedge fund databases often decide not to include data of the performance of certain funds from the moment that the funds cease to exist, thus creating a survivorship bias. This bias refers to the fact that hedge fund databases usually do not include data of the past performance of certain funds that, due to various reasons, have ceased to exist. In this regard, it must be said that certain studies conducted on large databases concluded that “survivorship bias exceeds 2% per year (Liang, 2000)”.

This aspect makes that the returns of the hedge funds included in the databases tend to be higher (overestimated) than the real returns achieved by the entire industry, since usually the funds tend to close and disappear in those cases in which they achieved negative or very low returns. In these cases, the returns will not be included in the database and consequently they will not have the negative impact that they should have. In addition to the above mentioned aspect, the risk level will tend to be lower than the real risk assumed by funds (it will tend to be underestimated).

Finally, it must be noted that the main reasons that may cause the disappearance of a certain fund of a database are the liquidation of the fund as a result of continued losses or low returns compared to other comparable funds of the industry; the merge of the fund with another fund; as well as the decision of the fund to stop reporting to the database for any reason, among others.

4.1.3.4 Instant history bias

Another important problem of hedge fund databases is the instant history bias. In this case, the bias appears because, once a certain hedge fund decides to report information of its performance to a database, the database often allows the fund to include information of its past performance, regardless of whether the fund was part of the database in the past, or not. This aspect allowed by different databases, often leads to a situation in which those funds that have achieved superior returns than the funds previously included in the database, will decide to be included in the database because of the possibility to include all their track record. This aspect makes that a great number of funds may decide not to be included in a given database as a result of having achieved a lower return than the funds included in the database.

This bias is an important problem that tends to increase the historical returns included in the databases, since hedge funds usually choose to include their past performance only in those cases in which the returns achieved are higher than the returns achieved by the funds included in the database.
4.1.3.5 NAV-related biases

In some cases, hedge fund databases include various biases resulting from the difficulty that certain funds have when calculating their NAV, due to certain problems that may arise at the time of calculating the price of some assets. This aspect makes that some funds may have to use a certain degree of subjectivity in the valuation of certain instruments or assets that may negatively impact the returns reported to the different databases. In addition and, as hedge funds are not obliged to distribute among investors the various procedures used by the fund in the valuation of certain assets, the problem may be aggravated.

These problems tend to occur in assets that have a low level of liquidity, such as shares of small/mid-capitalization companies; emerging market instruments; certain derivative contracts; as well as in OTC instruments, among others. In these cases, the fund, due to the illiquidity of the assets, will have to price the assets by using different models based on certain assumptions, which may be more or less correct, so the valuation of the assets may not be close to reality in certain occasions. This aspect may lead to a situation in which certain funds may use their subjectivity to price certain assets according to their interests, as well as to overestimate or underestimate the returns achieved. However and, in this regard, it must be noted that some studies concluded that “some managers distort returns when possible, e.g. when fund returns are at their discretion and when their reported returns are not closely monitored (Bollen & Pool, 2007)”.

Finally, it must also be noted that, in some cases, the databases may be biased due to errors in the calculation of the NAV by the administrators of certain funds, although this type of problem is less common.

4.1.3.6 Biases resulting from errors in the data

The last of the main biases that may have the different fund databases refers to possible errors that may have the data used. In this regard, and before including any data, the vendors of the databases often conduct a deep analysis of the data that is aimed to detect possible errors.

Among the main errors that may be found within the data provided by funds to the databases are aspects such as possible lost data; the existence of incorrect values, which have to be smoothed or eliminated; as well as problems resulting from the incorrect order of the data, among others.

Finally, it must be noted that there may be used different methodologies to resolve any possible problems or errors that may exist in the data. In this regard, all of the
methodologies and procedures are aimed to avoid the use of erroneous data that may lead to incorrect interpretations of the performance of the funds.

4.1.4 Advantages and disadvantages of hedge fund indexes

Hedge fund indexes have been experiencing a tremendous growth in recent years, mainly because they are powerful tools used by investors from around the world when making their investment decisions. However, they have a number of advantages and disadvantages that must be known\(^\text{185}\).

4.1.4.1 Advantages

Among the main advantages of hedge fund indexes are the following:

- When carrying out the asset allocation process, hedge fund indexes are a helpful tool, since they are often a good representative of the industry in terms of returns and risks. Furthermore, the fact that there are different indexes for each of the strategies implemented by the funds, allow investors to choose in a simple way the strategy that, in terms of risk-adjusted return, is the most appropriate to their interests.

- Indexes are usually used by investors as industry benchmarks, or as benchmarks of a given strategy, since they provide information about the profile of returns and risks of the funds included in them, being this an important aspect for investors when comparing different funds, particularly if they are considering to carry out an investment.

- On occasion, some instruments, such as passively managed funds or certain derivatives, try to replicate the performance of a particular benchmark, since there is a large number of investors who choose to make investments in a given asset class without assuming specific risks. In this regard, fund indexes are tools that allow investors to gain exposure to certain strategies implemented by the funds, with a higher level of diversification and lower risks, due to the several requirements that must be met by all the funds that want to be listed in the index.

- Finally and, due to the fact that there are great differences between the returns achieved by some well managed funds and the returns of other funds, investors often use fund indexes as references to determine if the performance of a given fund has been good or bad in comparison with the industry, or in comparison to other funds with a similar profile.

\(^{185}\) Lhabitant, F.: *Handbook of Hedge Funds*, Wiley, 2006
4.1.4.2 Disadvantages

On the other hand, the main disadvantages of hedge fund indexes are derived from the different data and methodologies used in their construction. This is one of the aspects that explain why there is not a hedge fund index universally accepted by the investment community. Among the main disadvantages of hedge fund indexes are the following:

- When constructing a certain index, vendors may use different databases that, as it was mentioned before, may have several biases. These biases, as are contained in the database used to construct the index, will also be present in the index, so that the return of the index may be overestimated or underestimated depending on the impact of the various biases included.

- As there is no universal classification of the different strategies implemented by hedge funds, there will be differences between the various indexes at the time of including certain funds in one category or in another, which may lead to differences in the behavior of the different existing indexes. In this regard, it must be said that recent studies concluded that there is “considerable heterogeneity between indices that aim to reflect the same type of strategy (Brooks & Kat, 2001)”.

- The last of the main disadvantages of hedge fund indexes is the fact that, at the time of the construction of the index, the vendor usually sets a number of requirements that must be met by the funds that want to be listed in the index. This aspect may lead to a situation in which certain funds will not be included in some indexes simply because they do not meet the requirements solicited, so that the behavior of the indexes will not be representative of the whole industry.

Among the various aspects that must be defined when constructing an index, must be highlighted the transparency of the index, since if a given index wants to be attractive, investors must be able to access to the several funds that compose the index, as well as to the data of returns achieved, whether free of charge or after the payment of a certain fee; the coverage of the index, being in this case essential to define if the index is intended to be representative of the entire industry or of only one of the different strategies implemented; as well as its weighting, since there will be some funds that, due to its longer track record, or due to their volume of assets under management, will have a higher weight in the index, although weights may be based in other criteria. Also, it is important to consider the investability of the index constituents, since if one of the funds of the index is not open to new investments, it will be quite difficult to replicate the performance of the index; as well as that the information of the index must be accessible by investors in a timely manner.

Finally, it must be noted that all the above aspects create biases, since they set restrictions that may exclude some funds from the indexes, so in these cases the representativity of certain indexes will not be complete.
4.2 ANALYSIS OF THE PERFORMANCE OF HEDGE FUNDS

In this section, an analysis of the performance of the hedge funds included in the database used in the study between 2008 and 2014 will be conducted. First, the individual performance of the main strategies implemented by hedge funds will be analyzed. Then and, after having analyzed the individual results, a comparative analysis will be carried out. However, and before presenting the different results of the analysis conducted, it is important to know the main characteristics of the database used.

4.2.1 Main features of the database

The database used to carry out the analysis of the performance of hedge funds between 2008 and 2014 has been the Credit Suisse Hedge Fund Database\textsuperscript{186}. Within it, the analysis focuses in the behavior of the Credit Suisse Hedge Fund Indexes, specifically the "Broad Indexes". These indexes have a number of features\textsuperscript{187} that must be known, among which are the following:

- The weights of the different hedge funds included in the indexes are assigned depending on the volume of assets under management of each fund. In this regard, those hedge funds that have a greater volume of assets under management, will have a greater weight in the index and, consequently, a greater relative importance. This feature, which is not usual in many other prestigious and relevant databases in which funds have the same weight, is an important fact to consider, since it implies a more accurate depiction of the hedge fund industry. However, it must be clarified that the weight of a hedge fund may not exceed the 15%.

- Broad Indexes are divided into a composite index, which measures the performance of the different individual indexes in aggregate terms, and 10 single indexes that measure the performance of the main strategies implemented by hedge funds. These strategies are shown in the following figure:

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{hedge_funds_strategies.png}
\caption{Hedge funds' strategies analyzed}
\end{figure}

\textit{Source: Compiled by author}

\textsuperscript{186} You can access to the database at the following link. However and, in order to have access to historical data, as well as to download any data, it is mandatory to be a registered user.

\textsuperscript{187} Source: \textit{Credit Suisse Hedge Fund Indexes, Index Rules}. Available online at the following link:
\url{http://www.hedgeindex.com/hedgeindex/documents/Credit_Suisse_Hedge_Fund_Indexes_HFI_Rulebook_2013_09.pdf}
The universe of hedge funds used to construct the indexes is defined as all funds with at least 50 million USD in assets under management; a track-record of at least one year; as well as with current and audited financial statements.

In addition to these requirements, hedge funds included in the index must sign an agreement with the calculation agent to allow it the use of data and confidential information, in the same way that funds must meet certain requirements when reporting information. In this regard, if any fund does not report data of the returns achieved during two consecutive months or of its assets under management for six consecutive months, it will be excluded from the index.

Finally, it must be noted that all the index calculations are made in USD, so in those cases in which it is necessary to transform data of assets under management denominated in a currency other than the USD, the value in the local currency will be multiplied by the existing exchange rate between that currency and the USD.

4.2.2 Individual analysis of the performance of the different strategies

In this section, the individual performance of the different strategies implemented by hedge funds will be analyzed. The metrics used in the analysis are shown in the following figure:

Figure 40: Statistics analyzed

<table>
<thead>
<tr>
<th>Returns</th>
<th>Volatility</th>
<th>Sharpe ratio</th>
<th>Treynor ratio</th>
<th>Maximum drawdown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beta</td>
<td>Best month</td>
<td>Worst month</td>
<td>Correlation</td>
<td>Recovery time</td>
</tr>
</tbody>
</table>

Source: Compiled by author

The choice of these metrics to perform the analysis is justified in the following aspects:

The combination of the different statistics analyzed allows to reach a clear and precise conclusion about the performance of the different strategies implemented by hedge funds and by UCITS. In this regard, the different metrics analyzed allow to reach conclusive results on the returns achieved, as well as on the risks, of each of the strategies analyzed. In addition, these metrics also allow to carry out a comparative analysis in a simple and clear way.
• The metrics chosen may be calculated in an easy way for any hedge fund or UCITS, regardless of the strategy or strategies implemented by the fund.

• The statistics chosen are the most used in the vast majority of the analyses aimed to evaluate the performance of hedge funds or UCITS, so their acceptance in the professional finance world is total.

• Finally and, due to the high number of metrics aimed to analyze the performance of hedge funds or UCITS, it is essential to choose a limited number of key statistics in order to keep the study within reasonable limits.

Also, it must be noted that each metric has been calculated for the last 1, 3 and 7 years. In this regard, the periods analyzed refer to the following dates:


Finally, it must be highlighted that the Sharpe and Treynor ratios of the several hedge fund indexes have been calculated by using as risk free rate the 90-days Treasury-Bill rate of the 17-01-2015, which was of a 0.025%. In addition, the betas of the different strategies have been calculated by using the S&P 500 Index as a proxy of the equity market. In this regard, it must be said that it has been used the S&P 500 Index because it is widely used by practitioners when calculating beta, as it is considered a good representative of the US equity market. This aspect also facilitates comparisons with the results/conclusions of other similar studies.

4.2.2.1 Credit Suisse Hedge Fund Index

The main data of the performance of the Credit Suisse Hedge Fund Index, which is an aggregate of the various strategies implemented by hedge funds, during the period analyzed are included in the following table:

<table>
<thead>
<tr>
<th></th>
<th>Return (total)</th>
<th>Return (annualized)</th>
<th>Volatility (monthly)</th>
<th>Volatility (annualized)</th>
<th>Sharpe ratio</th>
<th>Treynor ratio</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>4.43%</td>
<td>4.43%</td>
<td>0.85%</td>
<td>2.93%</td>
<td>1.50</td>
<td>-0.17</td>
<td>-0.26</td>
</tr>
<tr>
<td>3 years</td>
<td>20.22%</td>
<td>6.33%</td>
<td>0.96%</td>
<td>3.34%</td>
<td>1.89</td>
<td>-1.71</td>
<td>-0.04</td>
</tr>
<tr>
<td>7 years</td>
<td>29.60%</td>
<td>3.77%</td>
<td>1.82%</td>
<td>6.30%</td>
<td>0.60</td>
<td>0.47</td>
<td>0.08</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database.
As shown above, the index achieved a total return of around 30% between 2008 and 2014, as well as of 3.77% on an annualized basis. In addition, it must be highlighted that the annualized return achieved in the last 1 and 3 years is higher compared with that of the last 7 years, which is something that can be explained in part due to the end of the international financial crisis that began in late 2007.

In comparative terms, the following chart shows the evolution of the hedge fund index during the period analyzed compared to the main benchmark of the American equity market, the S&P 500. As can be seen, the returns achieved by the CS Hedge Fund Index have been higher than the ones of the S&P 500 throughout the crisis period but, since mid-2013, the situation changed.

![Chart 11: CS Hedge Fund Index vs S&P 500](chart)

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

Also, the annualized volatility of the CS Hedge Fund Index over the whole period analyzed stood at 6.3%, a high level that is explained again by the turbulences caused by the aforementioned financial crisis. However, and after the end of the crisis, the annualized volatility of the index fell greatly to a level of around 3%.

On the other hand, and in terms of risk-adjusted return, the 7-year Sharpe ratio stood at 0.6, indicating that the index offered 0.6 percentage points of net returns for each percentage point of total risk assumed. In addition, the Treynor ratio stood at 0.47, indicating that the index offered 0.47 percentage points of net returns for each percentage point of non-diversifiable risk assumed.
Along with the above statistics, the 7-year beta of the index stood at a level close to zero, indicating that the index has had a very low correlation with market movements during the period. This aspect explains one of the objectives of hedge funds, which seek to achieve attractive returns regardless of the market movements.

The following table includes other important performance statistics of the index:

**Table 27: Credit Suisse Hedge Fund Index (Other performance metrics)**

<table>
<thead>
<tr>
<th></th>
<th>Best month</th>
<th>Worst month</th>
<th>Maximum drawdown</th>
<th>Recovery time (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>1.72%</td>
<td>-0.80%</td>
<td>-0.29%</td>
<td>1</td>
</tr>
<tr>
<td>3 years</td>
<td>2.34%</td>
<td>-1.66%</td>
<td>0.00%</td>
<td>N/A</td>
</tr>
<tr>
<td>7 years</td>
<td>4.06%</td>
<td>-6.55%</td>
<td>-19.07%</td>
<td>16</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

As shown above, at its best month in the last 7 years, the index achieved a return of around a 4%; while at its worst month, it suffered a drop of more than a 6.5%. In addition, the maximum drawdown was of around a 19%, which was recovered in 16 months.

### 4.2.2.2 Credit Suisse Convertible Arbitrage Hedge Fund Index

The main metrics calculated for the period analyzed of the convertible arbitrage strategy are shown in the following table.

**Table 28: Credit Suisse Convertible Arbitrage Hedge Fund Index (Main performance metrics)**

<table>
<thead>
<tr>
<th></th>
<th>Return (total)</th>
<th>Return (annualized)</th>
<th>Volatility (monthly)</th>
<th>Volatility (annualized)</th>
<th>Sharpe ratio</th>
<th>Treynor ratio</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>3.69%</td>
<td>3.69%</td>
<td>0.54%</td>
<td>3.25%</td>
<td>-1.14</td>
<td>-0.26</td>
<td>0.14</td>
</tr>
<tr>
<td>3 years</td>
<td>9.82%</td>
<td>3.17%</td>
<td>0.89%</td>
<td>3.07%</td>
<td>1.02</td>
<td>0.50</td>
<td>0.06</td>
</tr>
<tr>
<td>7 years</td>
<td>27.80%</td>
<td>3.57%</td>
<td>2.70%</td>
<td>9.34%</td>
<td>0.38</td>
<td>0.20</td>
<td>0.18</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

Over the seven years analyzed, the strategy achieved a return of a 27.8%, which in annualized terms translates into a return of around a 3.6%. This aspect is particularly relevant when taking into account the international financial crisis that took place during the period analyzed. However, and over the past year, the strategy had a loss of approximately a 3.7%.

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188 **Note:** The N/A value in the recovery time column has two different meanings. On the one hand, if there has been a maximum drawdown in the period, N/A means that the maximum drawdown has not been recovered during the period. On the other hand, if there has not been any maximum drawdown in the period (maximum drawdown=0%), N/A means that there is nothing to recover.
When compared with the S&P 500 Index, the convertible arbitrage strategy has had a superior performance in almost all the analyzed period, although it underperformed the equity index since 2013, as can be seen in the following chart.

Chart 12: Credit Suisse Convertible Arbitrage Hedge Fund Index vs S&P 500

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

On the other hand, the annualized volatility of the strategy has been quite high over the seven years analyzed, as it stood at a level of around a 9.3%. In addition, the annualized volatility in the last 1 and 3 years was also high, as it stood above 3%.

In terms of risk-adjusted return, the Sharpe ratio of the strategy in the last seven years was of 0.38, so the strategy offered 0.38 percentage points of net returns for each percentage point of total risk assumed; while the Treynor ratio was of 0.20, indicating that the strategy offered 0.20 percentage points of net returns for each percentage point of market risk taken. In addition, the beta of the strategy for the entire period was of 0.18, indicating that the strategy has had little correlation with market movements during the period.

The following table lists other important metrics of the strategy for the period analyzed.

Table 29: Credit Suisse Convertible Arbitrage Hedge Fund Index (Other performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>Best month</th>
<th>Worst month</th>
<th>Maximum drawdown</th>
<th>Recovery time (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>2.09%</td>
<td>-1.79%</td>
<td>-1.68%</td>
<td>N/A</td>
</tr>
<tr>
<td>3 years</td>
<td>2.36%</td>
<td>-1.79%</td>
<td>0.00%</td>
<td>N/A</td>
</tr>
<tr>
<td>7 years</td>
<td>5.81%</td>
<td>-12.59%</td>
<td>-31.58%</td>
<td>12</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database
As can be seen, at its best month in the last seven years, the strategy achieved a return of around a 5.8%, while at its worst month, it posted a loss of around a 12.6%. Furthermore, the maximum drawdown of the strategy was of around a 31.6%, which was recovered in one year.

Finally, it must be noted that the strategy has had a high positive correlation with the multi-strategy index and with the fixed income arbitrage strategy. In addition, it has had a negative correlation with the dedicated short bias and managed futures strategies, as reflected in the following table.

<table>
<thead>
<tr>
<th></th>
<th>DS</th>
<th>EM</th>
<th>EMN</th>
<th>ED</th>
<th>FIA</th>
<th>GM</th>
<th>LSE</th>
<th>MF</th>
<th>Multi-strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correlation</td>
<td>-0.35</td>
<td>0.78</td>
<td>0.20</td>
<td>0.73</td>
<td>0.87</td>
<td>0.56</td>
<td>0.68</td>
<td>-0.09</td>
<td>0.88</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

### 4.2.2.3 Credit Suisse Dedicated Short Bias Hedge Fund Index

The main performance statistics of this strategy for the period analyzed are shown in the following table.

<table>
<thead>
<tr>
<th></th>
<th>Return (total)</th>
<th>Return (annualized)</th>
<th>Volatility (monthly)</th>
<th>Volatility (annualized)</th>
<th>Sharpe ratio</th>
<th>Treynor ratio</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>-6.57%</td>
<td>-4.57%</td>
<td>3.08%</td>
<td>10.66%</td>
<td>-0.45</td>
<td>-0.07</td>
<td>0.64</td>
</tr>
<tr>
<td>3 years</td>
<td>-38.98%</td>
<td>-15.18%</td>
<td>3.20%</td>
<td>11.07%</td>
<td>-1.37</td>
<td>-0.75</td>
<td>0.20</td>
</tr>
<tr>
<td>7 years</td>
<td>-63.00%</td>
<td>-13.21%</td>
<td>4.59%</td>
<td>15.22%</td>
<td>-0.87</td>
<td>-14.95</td>
<td>0.01</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

This strategy is the one that has had the worst performance throughout the whole period analyzed, since it posted a loss of a 63% in the last seven years; of around a 39% in the last three years; and of almost a 4.6% in the last year. In annualized terms, the losses were of more than a 13% in the last 7 years; of a 15.18% in the last 3 years; and of almost a 4.6 in the last year.

Compared with the S&P 500 Index, the strategy performed better during the years of the crisis, although it posted significant losses since the end of the crisis, as can be seen in the following chart.
In terms of risk, the annualized volatility of the strategy for the entire period analyzed was very high, reaching a level of over a 15.2% in the last seven years; of over an 11% in the last 3 years; and of almost a 10.7% in the last year.

On the other hand, the risk-adjusted return of the strategy has been very bad in the seven years analyzed, as indicated by its negative Sharpe ratio. In this regard, the strategy posted a net loss of about 0.87 percentage points for each percentage point of total risk assumed. In addition, the Treynor ratio over the period analyzed also took negative values, being particularly relevant the fact that, according to this ratio, the strategy posted a net loss of nearly 15 percentage points for each percentage point of market risk taken. Along with this, the beta of the strategy stood at a level close to zero.

Other important performance metrics of the strategy are shown in the following table.

**Table 32: Credit Suisse Dedicated Short Bias Hedge Fund Index (Other performance metrics)**

<table>
<thead>
<tr>
<th></th>
<th>Best month</th>
<th>Worst month</th>
<th>Maximum drawdown</th>
<th>Recovery time (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>4.68%</td>
<td>-4.82%</td>
<td>-7.51%</td>
<td>N/A</td>
</tr>
<tr>
<td>3 years</td>
<td>9.03%</td>
<td>-7.58%</td>
<td>-44.74%</td>
<td>N/A</td>
</tr>
<tr>
<td>7 years</td>
<td>9.66%</td>
<td>-11.28%</td>
<td>-61.66%</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database
At its best month, the strategy achieved a return of around a 9.7% in the last 7 years; of more than a 9% in the last three years; and of nearly a 4.7% in the last year. In addition, at its worst month, the strategy posted a loss of almost an 11.3% in the last seven years; of nearly a 7.6% in the last three years; and of more than a 4.8% in the last year. Furthermore, the maximum drawdown in the entire period was of almost a 61.7%, which has not been recovered yet.

Finally, it must be noted that the strategy has had a negative correlation with all the strategies, particularly with the long/short equity strategy, except with the managed futures strategy, as can be seen in the following table.

**Table 33: Credit Suisse Dedicated Short Hedge Fund Index (Correlation with other strategies)**

<table>
<thead>
<tr>
<th></th>
<th>CA</th>
<th>EM</th>
<th>EMN</th>
<th>ED</th>
<th>FIA</th>
<th>GM</th>
<th>LSE</th>
<th>MF</th>
<th>Multi-strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correlation</td>
<td>-0.35</td>
<td>-0.60</td>
<td>-0.27</td>
<td>-0.64</td>
<td>-0.56</td>
<td>-0.07</td>
<td>-0.72</td>
<td>0.08</td>
<td>-0.49</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

### 4.2.2.4 Credit Suisse Emerging Markets Hedge Fund Index

The following table summarizes the main results obtained after having analyzed the CS Emerging Markets Hedge Fund Index.

**Table 34: Credit Suisse Emerging Markets Hedge Fund Index (Main performance metrics)**

<table>
<thead>
<tr>
<th></th>
<th>Return (total)</th>
<th>Return (annualized)</th>
<th>Volatility (monthly)</th>
<th>Volatility (annualized)</th>
<th>Sharpe ratio</th>
<th>Treynor ratio</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>3.99%</td>
<td>3.89%</td>
<td>1.39%</td>
<td>4.48%</td>
<td>0.66</td>
<td>-0.11</td>
<td>-0.54</td>
</tr>
<tr>
<td>3 years</td>
<td>17.44%</td>
<td>5.50%</td>
<td>1.59%</td>
<td>5.52%</td>
<td>0.99</td>
<td>-1.21</td>
<td>-0.05</td>
</tr>
<tr>
<td>5 years</td>
<td>17.68%</td>
<td>2.35%</td>
<td>2.96%</td>
<td>10.27%</td>
<td>0.23</td>
<td>0.17</td>
<td>0.13</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

The total return of the strategy over the period analyzed was of about a 17.7%, a very acceptable level considering the crisis that began in late 2007. The strategy also performed well over the last three years, in which achieved a total return of a 17.44%. In annualized terms, the return in the last seven years was of a 2.35%; of a 5.5% in the last three years; as well as of around a 3.9% in the last year.

Compared with the main benchmark of the American equity market, the S&P 500, the strategy achieved a similar return, although slightly higher, over the years of the crisis, but lower since mid-2012, as can be seen in the following chart.
The annualized volatility of the strategy has been relatively high, as it stood at a level of around a 10.3% in the last seven years; of a 5.52% in the last three years; and of a 4.48% in the last year.

On the other hand, the risk-adjusted return of the strategy was also acceptable throughout the period analyzed, as the Sharpe ratio was of 0.23 in the last seven years, in the same way that the Treynor ratio was of 0.17. In this regard, the strategy offered 0.23 percentage points of net returns for each percentage point of total risk assumed, and 0.17 percentage points of net returns for each percentage point of market risk taken. Furthermore, the beta of the strategy was of 0.13, so its correlation with market movements was low during the period.

At its best month, the strategy posted a return of nearly a 7% in the last seven years, while, at its worst month, it posted a loss of more than a 13.6%. Along with this, the maximum drawdown of the strategy was of almost a 32%, which was recovered in 22 months, as shown in the following table.
Finally, it must be said that the strategy has had a high positive correlation with the long/short equity, multi-strategy and event driven strategies; as well as a negative correlation with the dedicated short bias strategy, as shown in the following table.

![Table 36: Credit Suisse Emerging Markets Hedge Fund Index (Correlation with other strategies)](image)

**4.2.2.5 Credit Suisse Equity Market Neutral Hedge Fund Index**

The main statistics of this strategy for the period analyzed are included in the following table.

![Table 37: Credit Suisse Equity Market Neutral Hedge Fund Index (Main performance metrics)](image)

As can be seen, the overall performance of the strategy in the last seven years has been very bad, as it posted a loss of over a 30.4%. However, in the last three years, the strategy achieved a return of an 8.7%, although in the last year, the strategy posted a loss of around a 1.3%. In annualized terms, the strategy posted a loss of a 5.05% in the last seven years; as well as a positive return of over a 2.8% in the last three years.

Compared with the main benchmark of the American equity market, the S&P 500, the strategy has had a bad performance because, since the beginning of the global financial crisis, it has remained below the equity index until now, as can be seen in the following chart.
The volatility of the strategy in the last seven years in annualized terms has been very high, as it stood at a 16.19%, although it was greatly reduced after the end of the crisis to a level of around a 3.8% in the last three years, and of close to a 1.8% in the last year.

In terms of risk-adjusted returns, the Sharpe ratio stood at a negative level of 0.31 in the last seven years, indicating that the strategy offered a net loss of 0.31 percentage points for each percentage point of total risk assumed; while the Treynor ratio was of 1.54, indicating that the strategy offered 1.54 percentage points of net returns for each percentage point of market risk taken. In addition, the beta of the strategy in the past seven years stood at a level close to zero.

The following table includes other relevant statistics of the strategy for the period analyzed.

<table>
<thead>
<tr>
<th></th>
<th>Best month</th>
<th>Worst month</th>
<th>Maximum drawdown</th>
<th>Recovery time (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>0.70%</td>
<td>-0.70%</td>
<td>-1.52%</td>
<td>NA</td>
</tr>
<tr>
<td>3 years</td>
<td>2.59%</td>
<td>-3.18%</td>
<td>-2.28%</td>
<td>4</td>
</tr>
<tr>
<td>7 years</td>
<td>3.66%</td>
<td>-40.45%</td>
<td>-43.03%</td>
<td>NA</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

In the last seven years, the strategy achieved a return of a 3.66% at its best month; of a 2.59% in the last three years; and of a 0.7% in the last year. However, at its worst month, the strategy posted a loss of a 40.45% in the last seven years; of approximately a
3.2% in the last three years; and of a 0.7% in the last year. Furthermore, the maximum drawdown in the last seven years was of over a 43%, which has not been recovered yet.

Finally, it must be noted that, in general terms, the strategy has had a relatively low level of correlation with other strategies, as can be seen in the following table. In this regard, the strategy has had the highest positive correlation with the multi-strategy index, in the same way that it has had the highest negative correlation with the dedicated short bias strategy.

4.2.2.6 Credit Suisse Event Driven Hedge Fund Index

The main metrics calculated for the period analyzed of the event driven strategy are shown in the following table.

| Table 39: Credit Suisse Equity Market Neutral Hedge Fund Index (Correlation with other strategies) |
| Correlation | CA | DS | EM | ED | FIA | GM | L/SE | MF | Multi-strategy |
| 0.20 | -0.27 | 0.26 | 0.37 | 0.37 | 0.05 | 0.28 | -0.04 | 0.45 |

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

The total return of the strategy over the past seven years has been of a 34.86%, which is a very positive performance given the circumstances of the period. Moreover, in the last three years, the strategy also achieved a return of over a 26.2%, as well as of almost a 1.3% in the last year. In annualized terms, the strategy achieved a return of a 4.36% in the last seven years; as well as of almost an 8.1% in the last three years.

Compared with the S&P 500 Index, the strategy performed better during the years of the crisis, although the trend reverted since mid-2013, as can be seen in the following graph.
Moreover, the annualized volatility of the strategy over the last seven years was of approximately a 7%; of a 4.2% in the last three years; and of over a 4.5% in the last year.

In terms of risk-adjusted return, the Sharpe ratio of the strategy was of 0.62 in the last seven years, so it offered a net return of 0.62 percentage points for each percentage point of total risk assumed; while its Treynor ratio was of 0.60, indicating that it offered a net return of 0.6 percentage points for each percentage point of market risk taken. In addition, the beta of the strategy over the past seven years stood at a level close to zero.

The following table lists other important metrics used to measure the performance of the strategy over the period analyzed.

**Table 41: Credit Suisse Event Driven Hedge Fund Index (Other performance metrics)**

<table>
<thead>
<tr>
<th></th>
<th>Best month</th>
<th>Worst month</th>
<th>Maximum drawdown</th>
<th>Recovery time (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>2.75%</td>
<td>-2.16%</td>
<td>0.00%</td>
<td>N/A</td>
</tr>
<tr>
<td>3 years</td>
<td>2.80%</td>
<td>-2.16%</td>
<td>0.00%</td>
<td>N/A</td>
</tr>
<tr>
<td>7 years</td>
<td>4.22%</td>
<td>-5.75%</td>
<td>-18.03%</td>
<td>11</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database
At its best month in the last seven years, the strategy achieved a return of over a 4.2%; of a 2.8% in the last three years; and of a 2.75% in the last year. Furthermore, at its worst month, the strategy posted a loss of a 5.75% in the last seven years; of nearly a 2.2% in the last three years; and of a 2.16% in the last year. In addition, the maximum drawdown in the period analyzed was of over an 18%, which was recovered in 11 months.

Finally, the strategy has had a high positive correlation with the long/short equity, multi-strategy and emerging markets strategies, as well as a high negative correlation with the dedicated short bias strategy, as shown below.

Table 42: Credit Suisse Event Driven Hedge Fund Index (Correlation with other strategies)

<table>
<thead>
<tr>
<th></th>
<th>CA</th>
<th>DS</th>
<th>EM</th>
<th>EMN</th>
<th>FIA</th>
<th>GM</th>
<th>LSE</th>
<th>MF</th>
<th>Multi-strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correlation</td>
<td>0.73</td>
<td>-0.64</td>
<td>0.83</td>
<td>0.37</td>
<td>0.63</td>
<td>0.47</td>
<td>0.89</td>
<td>0.09</td>
<td>0.86</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

4.2.2.7 Credit Suisse Fixed Income Arbitrage Hedge Fund Index

The following table summarizes the main results obtained after having analyzed the Credit Suisse Fixed Income Arbitrage Hedge Fund Index.

Table 43: Credit Suisse Fixed Income Arbitrage Hedge Fund Index (Main performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>Return (total)</th>
<th>Return (annualized)</th>
<th>Volatility (monthly)</th>
<th>Volatility (annualized)</th>
<th>Sharpe ratio</th>
<th>Treynor ratio</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>3.34%</td>
<td>3.34%</td>
<td>0.36%</td>
<td>1.03%</td>
<td>3.21</td>
<td>0.54</td>
<td>0.06</td>
</tr>
<tr>
<td>3 years</td>
<td>18.99%</td>
<td>5.94%</td>
<td>0.48%</td>
<td>1.65%</td>
<td>3.59</td>
<td>-12.23</td>
<td>-0.05</td>
</tr>
<tr>
<td>7 years</td>
<td>28.14%</td>
<td>3.61%</td>
<td>2.25%</td>
<td>7.80%</td>
<td>4.66</td>
<td>0.24</td>
<td>0.15</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

The total return of the strategy has been of over a 28.1% in the last seven years; of an 18.9% in the last three years; and of more than a 3.3% in the last year, indicating that the strategy performed very well throughout the period analyzed. In annualized terms, the strategy achieved a return of over a 3.6% in the last seven years; and of nearly a 6% in the last three years.

Compared with the S&P 500 Index, the strategy achieved higher returns during the years of the crisis, although slightly lower since mid-2013, as can be seen in the following graph.
Moreover, the annualized volatility of the strategy was of a 7.8% in the last seven years; of a 1.65% in the last three years; and of over a 1% in the last year.

In terms of risk-adjusted return, the Sharpe ratio of the strategy in the last seven years was of 0.46, so the strategy offered 0.46 percentage points of net returns for each percentage point of total risk assumed; while the Treynor ratio was of 0.24, indicating that the strategy offered 0.24 percentage points of net returns for each percentage point of market risk taken. In addition, the beta of the strategy in the last 7 years was of 0.15, indicating a low correlation of the strategy with market movements.

The following table lists other important statistics of the strategy analyzed.

<table>
<thead>
<tr>
<th>Table 44: Credit Suisse Fixed Income Arbitrage Hedge Fund Index (Other performance metrics)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Best month</strong></td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>1 year</td>
</tr>
<tr>
<td>3 years</td>
</tr>
<tr>
<td>7 years</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

At its best month, the strategy achieved a return of over a 4.3% in the last seven years; of around a 1.6% in the last three years; and of a 1% in the last year. Furthermore, at its worst month, the strategy posted a loss of over a 14% in the last seven years; of over a
1.1% in the last three years; and of a 0.1% in the last year. In addition, the maximum drawdown in the last 7 years was of more than a 28.8%, which was recovered in 22 months.

Finally, it must be said that the strategy has had a high positive correlation with the convertible arbitrage, multi-strategy and emerging markets strategies, as well as a negative correlation with the dedicated short bias and managed futures strategies, as can be seen in the following table.

<p>| Table 45: Credit Suisse Fixed Income Arbitrage Hedge Fund Index (Correlation with other strategies) |
|----------------------------------|----------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|</p>
<table>
<thead>
<tr>
<th>Correlation</th>
<th>CA</th>
<th>DS</th>
<th>EM</th>
<th>EMN</th>
<th>ED</th>
<th>GM</th>
<th>L/SE</th>
<th>MF</th>
<th>Multi-strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.87</td>
<td>-0.36</td>
<td>0.75</td>
<td>0.37</td>
<td>0.63</td>
<td>0.53</td>
<td>0.59</td>
<td>-0.10</td>
<td>0.81</td>
<td></td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

4.2.2.8 Credit Suisse Global Macro Hedge Fund Index

The main performance metrics of this strategy for the period analyzed are included in the following table.

<p>| Table 46: Credit Suisse Global Macro Hedge Fund Index (Main performance metrics) |
|----------------------------------|----------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|</p>
<table>
<thead>
<tr>
<th>Return (total)</th>
<th>Return (annualized)</th>
<th>Volatility (monthly)</th>
<th>Volatility (annualized)</th>
<th>Sharpe ratio</th>
<th>Treynor ratio</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>4.21%</td>
<td>4.21%</td>
<td>0.92%</td>
<td>2.81%</td>
<td>1.48</td>
<td>-0.16</td>
</tr>
<tr>
<td>3 years</td>
<td>11.13%</td>
<td>3.58%</td>
<td>0.95%</td>
<td>5.32%</td>
<td>1.08</td>
<td>-1.76</td>
</tr>
<tr>
<td>7 years</td>
<td>38.41%</td>
<td>4.75%</td>
<td>1.67%</td>
<td>5.78%</td>
<td>0.82</td>
<td>1.15</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

The total return achieved by the strategy was of more than a 38.4% in the last seven years; of an 11.13% in the last three years; and of more than a 4.2% in the last year. In annualized terms, the strategy achieved a return of a 4.75% in the last seven years; and of nearly a 3.6% in the last three years.

Compared with the S&P 500 Index, the strategy performed better over almost the entire period analyzed, although at the end of 2014 the trend reverted, as can be seen in the following chart.
On the other hand, the annualized volatility of the strategy was of nearly a 5.8% in the last seven years; of around a 3.3% in the last three years; and of more than a 2.8% in the last year.

In terms of risk-adjusted returns, the Sharpe ratio of the strategy in the last seven years was of 0.82, so the strategy offered 0.82 percentage points of net returns for each percentage point of total risk assumed; while its Treynor ratio was of 1.15, indicating that the strategy offered 1.15 percentage points of net returns for each percentage point of market risk taken. Also, the beta of the strategy over the past seven years stood at a level close to zero.

The following table lists other important metrics of the strategy analyzed.

**Table 47: Credit Suisse Global Macro Hedge Fund Index (Other performance metrics)**

<table>
<thead>
<tr>
<th></th>
<th>Best month</th>
<th>Worst month</th>
<th>Maximum drawdown</th>
<th>Recovery time (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>1.65%</td>
<td>-1.05%</td>
<td>-1.05%</td>
<td>4</td>
</tr>
<tr>
<td>3 years</td>
<td>2.14%</td>
<td>-2.48%</td>
<td>0.00%</td>
<td>N/A</td>
</tr>
<tr>
<td>7 years</td>
<td>4.44%</td>
<td>-6.63%</td>
<td>-7.10%</td>
<td>9</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database
At its best month, the strategy achieved a return of a 4.44% in the last seven years; of nearly a 2.15% in the last three years; and of a 1.65% in the last year. Furthermore, at its worst month, the strategy posted a loss of a 6.63% in the last seven years; of nearly a 2.5% in the last three years; and of over a 1% in the last year. In addition, the maximum drawdown in the last seven years was of a 7.1%, which was recovered in 9 months.

Finally, the strategy has had significant positive correlations with the emerging markets and convertible arbitrage strategies, as well as a negative correlation, although close to zero, with the dedicated short bias strategy, as shown in the following table.

**Table 48: Credit Suisse Global Macro Hedge Fund Index (Correlation with other strategies)**

<table>
<thead>
<tr>
<th>Correlation</th>
<th>CA</th>
<th>DS</th>
<th>EM</th>
<th>EMN</th>
<th>ED</th>
<th>FIA</th>
<th>L/SE</th>
<th>MF</th>
<th>Multi-strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.56</td>
<td>-0.07</td>
<td>0.59</td>
<td>0.05</td>
<td>0.47</td>
<td>0.53</td>
<td>0.50</td>
<td>0.55</td>
<td>0.56</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

**4.2.2.9 Credit Suisse Long/Short Equity Hedge Fund Index**

The main metrics calculated for the period analyzed of the long/short equity strategy are shown in the following table.

**Table 49: Credit Suisse Long/Short Equity Hedge Fund Index (Main performance metrics)**

<table>
<thead>
<tr>
<th></th>
<th>1 year</th>
<th>2.5%</th>
<th>1.28%</th>
<th>4.41%</th>
<th>1.27</th>
<th>-0.17</th>
<th>-0.34</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return (total)</td>
<td>5.63%</td>
<td>5.63%</td>
<td>1.28%</td>
<td>4.41%</td>
<td>1.27</td>
<td>-0.17</td>
<td>-0.34</td>
</tr>
<tr>
<td>Return (annualized)</td>
<td>29.41%</td>
<td>8.97%</td>
<td>1.60%</td>
<td>5.54%</td>
<td>1.61</td>
<td>-1.45</td>
<td>-0.62</td>
</tr>
<tr>
<td>Volatility (monthly)</td>
<td>36.08%</td>
<td>4.50%</td>
<td>2.48%</td>
<td>8.58%</td>
<td>0.52</td>
<td>0.44</td>
<td>0.19</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

The total return of the strategy was of nearly a 36.1% in the last seven years; of more than a 29.4% in the last three years; and of more than a 5.6% in the last year. In annualized terms, the strategy achieved a return of a 4.5% in the last seven years; and of almost a 9% in the last three years.

Compared with the main benchmark of the American equity market, the S&P 500, the strategy performed better during the international financial crisis, although the trend reverted in mid-2012, as can be seen in the following chart.
On the other hand, the strategy has had an annualized volatility of nearly an 8.6% in the last seven years; of over a 5.5% in the last three years; and of around a 4.4% in the last year.

In terms of risk-adjusted returns, the Sharpe ratio of the strategy in the last seven years was of 0.52, indicating that it offered 0.52 percentage points of net returns for each percentage point of total risk assumed; while its Treynor ratio was of 0.44, indicating that the strategy offered 0.44 percentage points of net returns for each percentage point of market risk taken. In addition, the beta of the strategy in the last seven years was of 0.1.

The following table includes other performance metrics of the strategy for the period analyzed.

<table>
<thead>
<tr>
<th>Time Frame</th>
<th>Best month</th>
<th>Worst month</th>
<th>Maximum drawdown</th>
<th>Recovery time (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>2.88%</td>
<td>-1.19%</td>
<td>-0.08%</td>
<td>1</td>
</tr>
<tr>
<td>3 years</td>
<td>3.91%</td>
<td>-4.53%</td>
<td>0.00%</td>
<td>N/A</td>
</tr>
<tr>
<td>7 years</td>
<td>5.23%</td>
<td>-7.81%</td>
<td>-20.95%</td>
<td>20</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database
At its best month, the strategy achieved a return of more than a 5.2% in the last seven years; of more than a 3.9% in the last three years; and of nearly a 2.9% in the last year. Furthermore, at its worst month, the strategy posted a loss of approximately a 7.8% in the last seven years; of over a 4.5% in the last three years; and of nearly a 1.2% in the last year. In addition, the maximum drawdown in the last seven years was of almost a 21%, which was recovered in 20 months.

Finally, it must be noted that the strategy has had a high positive correlation with the emerging markets and event driven strategies, as well as a significant negative correlation with the dedicated short bias strategy, as shown in the following table.

**Table 51: Credit Suisse Long/Short Equity Hedge Fund Index (Correlation with other strategies)**

<table>
<thead>
<tr>
<th></th>
<th>CA</th>
<th>DS</th>
<th>EM</th>
<th>EMN</th>
<th>ED</th>
<th>FIA</th>
<th>GM</th>
<th>MF</th>
<th>Multi-strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correlation</td>
<td>0.68</td>
<td>-0.72</td>
<td>0.90</td>
<td>0.28</td>
<td>0.89</td>
<td>0.59</td>
<td>0.50</td>
<td>0.15</td>
<td>0.85</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

**4.2.2.10 Credit Suisse Managed Futures Hedge Fund Index**

The main performance metrics of this strategy for the period analyzed are shown in the following table.

**Table 52: Credit Suisse Managed Futures Hedge Fund Index (Main performance metrics)**

<table>
<thead>
<tr>
<th></th>
<th>Return (total)</th>
<th>Return (annualized)</th>
<th>Volatility (monthly)</th>
<th>Volatility (annualized)</th>
<th>Sharpe ratio</th>
<th>Treynor ratio</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>22.56%</td>
<td>22.56%</td>
<td>2.93%</td>
<td>10.14%</td>
<td>2.22</td>
<td>-0.33</td>
<td>-0.96</td>
</tr>
<tr>
<td>3 years</td>
<td>10.69%</td>
<td>5.34%</td>
<td>2.90%</td>
<td>10.03%</td>
<td>0.24</td>
<td>-0.84</td>
<td>-0.041</td>
</tr>
<tr>
<td>7 years</td>
<td>27.80%</td>
<td>5.37%</td>
<td>3.10%</td>
<td>10.73%</td>
<td>0.33</td>
<td>-0.75</td>
<td>-0.05</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

The total return of the strategy was of a 27.8% in the last seven years; of around a 10.7% in the last three years; and of more than a 22.5% in the last year. In this regard, it must be noted that the strategy performed very well over the period analyzed. In annualized terms, the strategy achieved a return of nearly a 3.6% in the last seven years; as well as of more than a 3.4% in the last three years.

Compared with the S&P 500 Index, the strategy performed better during the international financial crisis, although the trend reverted in mid-2013, as shown in the following chart.
Moreover, the annualized volatility of the strategy was of more than a 10.7% in the last seven years; of more than a 10% in the last three years; as well as of more than a 10.1% in the last year. In this regard, it must be noted that the strategy has had a high volatility throughout the period analyzed.

In terms of risk-adjusted returns, the Sharpe ratio of the strategy in the last 7 years was of 0.33, indicating that it offered 0.33 percentage points of net returns for each percentage point of total risk assumed. On the other hand, the strategy had a negative Treynor ratio of 0.75, indicating that it posted a net loss of 0.75 percentage points for each percentage point of market risk taken. In addition, the beta stood at a negative level, although very close to zero.

The following table lists other important metrics used to measure the performance of the strategy over the period analyzed.

Table 53: Credit Suisse Managed Futures Hedge Fund Index (Other performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>Best month</th>
<th>Worst month</th>
<th>Maximum drawdown</th>
<th>Recovery time (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>7.50%</td>
<td>-3.42%</td>
<td>-4.29%</td>
<td>3</td>
</tr>
<tr>
<td>3 years</td>
<td>7.50%</td>
<td>-5.42%</td>
<td>-10.10%</td>
<td>12</td>
</tr>
<tr>
<td>7 years</td>
<td>7.50%</td>
<td>-5.42%</td>
<td>0.00%</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database
At its best month, the strategy achieved a return of a 7.5% in the last 1, 3 and 7 years; while at its worst month, it posted a loss of over a 5.4% in the last 3 and 7 years, and of over a 3.4% in the last year. In addition, the strategy has had no maximum drawdown in the last seven years, although if the period analyzed is restricted exclusively to the last three years, the maximum drawdown was of a 10.1%, which was recovered in one year.

Finally, it must be noted that the strategy does not present significant correlations with any of the strategies discussed so far. However, the highest positive correlation is achieved with the global macro strategy, while the highest negative correlation is achieved with the fixed income arbitrage strategy, as can be seen in the following table.

**Table 54: Credit Suisse Managed Futures Hedge Fund Index (Correlation with other strategies)**

<table>
<thead>
<tr>
<th>Correlation</th>
<th>CA</th>
<th>DS</th>
<th>EM</th>
<th>EMN</th>
<th>ED</th>
<th>FIA</th>
<th>GM</th>
<th>L/SE</th>
<th>Multi-strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>-0.09</td>
<td>0.08</td>
<td>0.11</td>
<td>-0.04</td>
<td>0.09</td>
<td>-0.10</td>
<td>0.55</td>
<td>0.15</td>
<td>0.03</td>
<td></td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

### 4.2.2.11 Credit Suisse Multi-Strategy Hedge Fund Index

The main performance metrics of the last of the strategies analyzed are listed in the following table.

**Table 55: Credit Suisse Multi-Strategy Hedge Fund Index (Main performance metrics)**

<table>
<thead>
<tr>
<th>Return (total)</th>
<th>Return (annualized)</th>
<th>Volatility (monthly)</th>
<th>Volatility (annualized)</th>
<th>Sharpe ratio</th>
<th>Treynor ratio</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>5.24%</td>
<td>5.24%</td>
<td>0.64%</td>
<td>2.22%</td>
<td>2.35</td>
<td>-0.67</td>
</tr>
<tr>
<td>3 years</td>
<td>28.05%</td>
<td>8.59%</td>
<td>0.39%</td>
<td>1.72%</td>
<td>3.15</td>
<td>-4.20</td>
</tr>
<tr>
<td>7 years</td>
<td>41.55%</td>
<td>5.00%</td>
<td>1.84%</td>
<td>6.36%</td>
<td>0.80</td>
<td>0.48</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

The total return of the strategy was of a 41.55% in the last seven years; of more than a 28% in the last three years; and of more than a 5.2% in the last year. In this regard, it must be noted that hedge funds specialized in the implementation of various strategies have had a very good performance throughout the period analyzed. In annualized terms, the strategy achieved a return of nearly a 5.1% in the last seven years; and of nearly an 8.6% in the last three years.
Compared with the S&P 500 Index, the strategy performed better during the international financial crisis, although the trend reverted since mid-2013, as can be seen in the following chart.

![Chart 21: Credit Suisse Multi-Strategy Hedge Fund Index vs S&P 500](image)

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

On the other hand, the annualized volatility of the strategy was of nearly 6.4% in the last seven years; of over 2.7% in the last three years; and of around 2.2% in the last year.

In terms of risk-adjusted returns, the 7-year Sharpe ratio of the strategy was of 0.8, so it offered 0.8 percentage points of net returns for each percentage point of total risk assumed; while the Treynor ratio was of 0.48, indicating that the strategy offered 0.48 percentage points of net returns for each percentage point of market risk taken. In addition, the beta of the strategy in the last seven years was of 0.1, indicating that the strategy has had a low correlation with market movements.

The following table lists other important statistics of the strategy analyzed.

<table>
<thead>
<tr>
<th>Time Frame</th>
<th>Best month</th>
<th>Worst month</th>
<th>Maximum drawdown</th>
<th>Recovery time (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>1.41%</td>
<td>-0.49%</td>
<td>0.00%</td>
<td>N/A</td>
</tr>
<tr>
<td>3 years</td>
<td>2.47%</td>
<td>-1.17%</td>
<td>0.00%</td>
<td>N/A</td>
</tr>
<tr>
<td>7 years</td>
<td>4.28%</td>
<td>-7.35%</td>
<td>-23.64%</td>
<td>22</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database
At its best month, the strategy achieved a return of nearly a 4.3% in the last seven years; of nearly a 2.5% in the last three years; and of over a 1.4% in the last year. Furthermore, at its worst month, the strategy posted a loss of a 7.35% in the last seven years; of nearly a 1.2% in the last three years; as well as of around a 0.5% in the last year. In addition, the maximum drawdown in the past seven years was of over a 23.6%, which was recovered in 22 months.

Finally, it must be noted that the strategy has had high positive correlations with the convertible arbitrage, emerging markets and event driven strategies, as well as a strong negative correlation with the dedicated short bias strategy, as shown in the following table.

Table 57: Credit Suisse Multi-Strategy Hedge Fund Index (Correlation with other strategies)

<table>
<thead>
<tr>
<th></th>
<th>CA</th>
<th>DS</th>
<th>EM</th>
<th>EMN</th>
<th>ED</th>
<th>FIA</th>
<th>GM</th>
<th>LSE</th>
<th>MF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correlation</td>
<td>0.88</td>
<td>-0.49</td>
<td>0.87</td>
<td>0.45</td>
<td>0.86</td>
<td>0.81</td>
<td>0.56</td>
<td>0.85</td>
<td>0.03</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

4.2.3 Comparative analysis of the performance of hedge fund strategies

After having analyzed the performance of the different strategies implemented by hedge funds on an individual basis, it is time to carry out a comparative analysis between strategies.

4.2.3.1 Returns

The following tables show the returns achieved by the different strategies analyzed, in total and in annualized terms. Also, the tables include the 7-year returns of the strategies ordered from highest to lowest, since the longer the period analyzed, the more representative will be the analysis and the conclusions reached.

Table 58: Comparative analysis of hedge fund strategies: Return (total)

<table>
<thead>
<tr>
<th></th>
<th>BFI</th>
<th>CA</th>
<th>DS</th>
<th>EM</th>
<th>EMN</th>
<th>ED</th>
<th>FIA</th>
<th>GM</th>
<th>LSE</th>
<th>MF</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>4.43%</td>
<td>-0.69%</td>
<td>-0.47%</td>
<td>3.89%</td>
<td>-1.27%</td>
<td>1.28%</td>
<td>3.34%</td>
<td>4.21%</td>
<td>5.68%</td>
<td>13.56%</td>
</tr>
<tr>
<td>3 years</td>
<td>20.22%</td>
<td>9.82%</td>
<td>-30.98%</td>
<td>17.44%</td>
<td>8.78%</td>
<td>26.21%</td>
<td>38.99%</td>
<td>11.33%</td>
<td>29.41%</td>
<td>28.05%</td>
</tr>
<tr>
<td>7 years</td>
<td>29.60%</td>
<td>27.80%</td>
<td>-63.00%</td>
<td>17.68%</td>
<td>-10.43%</td>
<td>34.86%</td>
<td>38.14%</td>
<td>38.04%</td>
<td>36.00%</td>
<td>27.80%</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database
In the last seven years, the multi-strategy index achieved the highest return, in total and in annualized terms, followed by the global macro and long/short equity strategies; while the least profitable strategy was dedicated short bias, followed by equity market neutral. In this regard, the total return of the strategies in the last seven years has ranged from a loss of a 63% of the dedicated short bias strategy to a gain of a 41.55% of the multi-strategy index. On the other hand, and in annualized terms, the returns ranged from a loss of a 13.24% of the dedicated short bias strategy to a gain of a 5.09% of the multi-strategy index, as can be seen in the following table.

### Table 59: Comparative analysis of hedge fund strategies: Return (annualized)

<table>
<thead>
<tr>
<th></th>
<th>HFI</th>
<th>CA</th>
<th>DS</th>
<th>EM</th>
<th>EMN</th>
<th>ED</th>
<th>FIA</th>
<th>GM</th>
<th>LSE</th>
<th>MF</th>
<th>Multi-strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>4.43%</td>
<td>3.69%</td>
<td>-4.57%</td>
<td>3.89%</td>
<td>-3.25%</td>
<td>1.20%</td>
<td>1.34%</td>
<td>4.11%</td>
<td>5.63%</td>
<td>22.50%</td>
<td>5.24%</td>
</tr>
<tr>
<td>3 years</td>
<td>6.38%</td>
<td>3.17%</td>
<td>-15.10%</td>
<td>5.50%</td>
<td>2.82%</td>
<td>8.07%</td>
<td>5.94%</td>
<td>3.98%</td>
<td>4.97%</td>
<td>3.44%</td>
<td>8.29%</td>
</tr>
<tr>
<td>5 years</td>
<td>3.77%</td>
<td>3.57%</td>
<td>-13.34%</td>
<td>2.35%</td>
<td>-5.08%</td>
<td>4.36%</td>
<td>3.61%</td>
<td>4.73%</td>
<td>4.50%</td>
<td>3.57%</td>
<td>5.09%</td>
</tr>
</tbody>
</table>

7-year annualized return (ordered from highest to lowest)

<table>
<thead>
<tr>
<th></th>
<th>Multi-strategy</th>
<th>GM</th>
<th>LSE</th>
<th>ED</th>
<th>EHF</th>
<th>FIA</th>
<th>CA</th>
<th>MF</th>
<th>EM</th>
<th>EMN</th>
<th>DS</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 years</td>
<td>5.09%</td>
<td>4.70%</td>
<td>4.50%</td>
<td>4.50%</td>
<td>3.77%</td>
<td>3.61%</td>
<td>3.57%</td>
<td>3.57%</td>
<td>2.33%</td>
<td>-5.05%</td>
<td>-13.24%</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

However, in the last three years, the long/short equity strategy achieved the highest return, followed by multi-strategy and event driven; while the strategy with the lowest return was dedicated short bias. In this regard, the total return of the strategies in the last three years ranged from a loss of a 38.98% of the dedicated short bias strategy to a gain of a 29.41% of the long/short equity strategy. In annualized terms, the returns ranged from a loss of a 15.18% of the dedicated short bias strategy to a gain of an 8.97% of the long/short equity strategy.

Finally, in the last year, the best strategy in terms of returns, with a big difference, has been managed futures, followed by long/short equity; while the worst strategy was, again, dedicated short bias, followed by convertible arbitrage. In this case, the returns ranged from a loss of a 4.57% of the dedicated short bias strategy to a profit of a 22.56% of the managed futures strategy.

On the other hand, it must be highlighted that most of the strategies implemented by hedge funds achieved superior returns than those of the main benchmark of the American equity market, the S&P 500, during the international financial crisis that began in 2007, with the exception of the equity market neutral strategy, which performed very bad. In addition, since 2010, the S&P 500 index was able to beat the dedicated short bias strategy. However, the trend began to change since early 2012,
when the S&P 500 index began to achieve higher returns than those of certain strategies such as long/short equity and emerging markets. Shortly afterwards and, since mid-2013, the S&P 500 index started to outperform the indexes of several strategies such as convertible arbitrage, multi-strategy, event driven, managed futures, fixed income arbitrage, as well as to the hedge funds index. Finally, the S&P 500 index was also able to outperform the global macro strategy since mid-2014, as can be seen in the following chart.

Additionally, the following graph shows the total return achieved by each of the strategies for each of the periods analyzed.
4.2.3.2 Volatility

The annualized volatilities of the different strategies analyzed are shown in the following table.

Table 60: Comparative analysis of hedge fund strategies: Volatility (annualized)

<table>
<thead>
<tr>
<th></th>
<th>HH</th>
<th>CA</th>
<th>DS</th>
<th>EM</th>
<th>ENN</th>
<th>ED</th>
<th>FA</th>
<th>GM</th>
<th>LSE</th>
<th>MF</th>
<th>Multi-strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>1.93%</td>
<td>3.25%</td>
<td>10.66%</td>
<td>4.48%</td>
<td>1.79%</td>
<td>4.33%</td>
<td>1.03%</td>
<td>1.93%</td>
<td>4.42%</td>
<td>10.14%</td>
<td>2.22%</td>
</tr>
<tr>
<td>3 years</td>
<td>3.24%</td>
<td>5.07%</td>
<td>11.0%</td>
<td>5.52%</td>
<td>3.78%</td>
<td>4.30%</td>
<td>1.65%</td>
<td>3.23%</td>
<td>5.54%</td>
<td>10.03%</td>
<td>2.72%</td>
</tr>
<tr>
<td>7 years</td>
<td>6.30%</td>
<td>9.34%</td>
<td>15.21%</td>
<td>10.27%</td>
<td>16.19%</td>
<td>6.96%</td>
<td>7.80%</td>
<td>5.70%</td>
<td>8.58%</td>
<td>10.73%</td>
<td>6.80%</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database
In the last seven years, the strategy with the highest annualized volatility has been equity market neutral, followed by dedicated short bias and managed futures; while the strategy with the lowest annualized volatility has been global macro. In this case, the annualized volatilities have ranged from a 16.19% of the equity market neutral strategy to a 5.78% of the global macro strategy.

On the other hand, in the last three years, the strategy with the highest annualized volatility has been dedicated short bias, followed by managed futures; while the strategies with the lowest annualized volatilities have been fixed income arbitrage and multi-strategy. In this period, the volatilities have ranged from an 11.07% of the dedicated short bias strategy to a 1.65% of the fixed income arbitrage strategy.

Finally, in the last year, the strategies with the highest annualized volatilities have been dedicated short bias and managed futures; while the strategies with the lowest annualized volatilities have been fixed income arbitrage and equity market neutral. In this case, the volatilities have ranged from a 10.66% of the dedicated short bias strategy to a 1.03% of the fixed income arbitrage strategy.

In addition, the performance of each of the strategies in terms of risk-return is shown in the following graph. The further to the left and up, the better.
4.2.3.3 Risk-adjusted returns

The Sharpe ratios of the different strategies analyzed are shown in the following table.

<table>
<thead>
<tr>
<th></th>
<th>EFH</th>
<th>CA</th>
<th>DM</th>
<th>EM</th>
<th>EMN</th>
<th>ED</th>
<th>FIA</th>
<th>GM</th>
<th>L/SE</th>
<th>MF</th>
<th>Multi-strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>1.50</td>
<td>-1.14</td>
<td>0.43</td>
<td>0.86</td>
<td>-0.73</td>
<td>0.28</td>
<td>3.21</td>
<td>1.48</td>
<td>1.27</td>
<td>2.22</td>
<td>2.35</td>
</tr>
<tr>
<td>3 years</td>
<td>1.89</td>
<td>1.02</td>
<td>1.27</td>
<td>0.99</td>
<td>0.74</td>
<td>1.11</td>
<td>3.59</td>
<td>1.08</td>
<td>1.61</td>
<td>0.54</td>
<td>3.15</td>
</tr>
<tr>
<td>7 years</td>
<td>0.60</td>
<td>0.38</td>
<td>0.87</td>
<td>0.23</td>
<td>-0.31</td>
<td>0.62</td>
<td>0.46</td>
<td>0.82</td>
<td>0.52</td>
<td>0.23</td>
<td>0.80</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>GM</th>
<th>Multi-strategy</th>
<th>ED</th>
<th>EFH</th>
<th>L/SE</th>
<th>FIA</th>
<th>CA</th>
<th>MF</th>
<th>EM</th>
<th>EMN</th>
<th>DS</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 years</td>
<td>0.02</td>
<td>0.00</td>
<td>0.62</td>
<td>0.60</td>
<td>0.52</td>
<td>0.46</td>
<td>0.38</td>
<td>0.33</td>
<td>0.23</td>
<td>-0.31</td>
<td>-0.87</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

In the last seven years, the most efficient strategy has been global macro, followed by multi-strategy, as they offered 0.82 and 0.8 percentage points of net returns for each percentage point of total risk taken; while the less efficient strategies have been dedicated short bias and equity market neutral, as they posted a net loss of 0.87 and of 0.31 percentage points for each percentage point of total risk assumed. In this case, the Sharpe ratios have ranged from a -0.87 of the dedicated short bias strategy to a 0.82 of the global macro strategy.

On the other hand, in the last three years, the most efficient strategies have been fixed income arbitrage and multi-strategy, as they offered 3.59 and 3.15 percentage points of net returns for each percentage point of total risk assumed; while the less efficient strategies have been dedicated short bias and managed futures. In this case, the Sharpe ratios have ranged from a -1.37 of the dedicated short bias strategy to a 3.59 of the fixed income arbitrage strategy.

Finally, in the last year, the most efficient strategies have been fixed income arbitrage and multi-strategy; while the less efficient strategies have been convertible arbitrage and equity market neutral, as they posted a net loss of 1.14 and of 0.73 percentage points for each percentage point of total risk assumed. In this case, the Sharpe ratios have ranged from a -1.14 of the convertible arbitrage strategy to a 3.21 of the fixed income arbitrage strategy.

On the other hand, the Treynor ratios of the different strategies analyzed are shown in the following table.
In the last seven years, the most efficient strategies have been equity market neutral and global macro, as they offered 1.54 and 1.15 percentage points of net returns for each percentage point of market risk taken; while the less efficient strategies have been dedicated short bias and managed futures, as they posted a net loss of 14.95 and of 0.75 percentage points for each percentage point of market risk taken. In this case, the Treynor ratios have ranged from a -14.95 of the dedicated short bias strategy to a 1.54 of the equity market neutral strategy.

On the other hand, in the last three years, the most efficient strategy has been convertible arbitrage, since it is the only strategy that offered a positive net return of 0.5 percentage points for each percentage point of market risk assumed; while the less efficient strategies have been fixed income arbitrage and multi-strategy. In this case, the Treynor ratios have ranged from a -12.23 of the fixed income arbitrage strategy to a 0.5 of the convertible arbitrage strategy.

Finally, in the last year, the most efficient strategies have been fixed income arbitrage and equity market neutral, since they have been the only strategies that have offered positive net returns for each percentage point of market risk assumed; while the less efficient strategies have been multi-strategy and convertible arbitrage. In this case, the Treynor ratios have ranged from a -0.67 of the multi-strategy index to a 0.54 of the fixed income arbitrage strategy.

The following chart shows the level of efficiency of each of the hedge funds’ strategies according to their Sharpe and Treynor ratios. In this regard, it must be said that, the further to the right and up, the better.
4.2.3.4 Beta

The betas of the several strategies for the different periods analyzed are shown in the following table.
In general terms, it must be noted that, in the last seven years, none of the strategies has been highly correlated with market movements, since their betas have been close to zero. The closest to zero beta was achieved by the dedicated short bias strategy, while the highest beta was achieved by the convertible arbitrage strategy. In this case and, as can be seen in the following chart, the betas have ranged from a -0.05 of the managed futures strategy to a 0.18 of the convertible arbitrage strategy.

As in the previous case, in the last three years, the betas of the different strategies analyzed stood at a level close to zero. The closest to zero beta during this period was achieved by the fixed income arbitrage strategy, while the highest beta was achieved by the dedicated short bias strategy. In this case, the betas have ranged from a -0.07 of the equity market neutral strategy to a 0.2 of the dedicated short bias strategy.
Finally, in the last year, the strategy with the highest beta has been managed futures, with a beta of -0.96, indicating that the strategy has moved in the opposite way to market movements, followed by dedicated short bias, with a positive beta of 0.64; while the strategy with the closest to zero beta has been fixed income arbitrage. In this period, the betas have ranged from a -0.96 of the managed futures strategy to a 0.64 of the dedicated short bias strategy.

### 4.2.3.5 Other important performance metrics

The following table shows the returns achieved by each of the strategies at their best months for each of the periods analyzed.

| Table 64: Comparative analysis of hedge fund strategies: Best month |
|------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
|                       | HSFI                | CA                  | DS                  | EM                  | EMN                 | FD                 | FIA                 | GM                  | LESE                |
| 1 year                | 1.72%               | 0.93%               | 1.79%               | 0.59%               | 0.25%               | 1.00%               | 0.56%               | 0.37%               | 2.97%               |
| 3 years               | 2.34%               | 0.26%               | 0.10%               | 1.64%               | 0.60%               | 2.00%               | 0.41%               | 0.85%               | 3.84%               |
| 7 years               | 4.06%               | 0.01%               | 0.66%               | 1.66%               | 0.43%               | 4.22%               | 0.43%               | 4.44%               | 5.23%               |

In the last seven years, the strategy with the best month was dedicated short bias, with a return of nearly a 9.7%, followed by managed futures, with a return of a 7.5%. In this case, the returns achieved by the strategies at their best months ranged from a 9.66% of the dedicated short bias strategy to a 3.66% of the equity market neutral strategy.

On the other hand, in the last three years, the strategies with the best months have been dedicated short bias and managed futures, with returns of around a 9% and of a 7.5%. In this case, the returns achieved by the strategies at their best months ranged from a 9.03% of the dedicated short bias strategy to a 1.62% of the fixed income arbitrage strategy.

Finally, in the last year, the strategy with the best month was managed futures, with a return of a 7.5%, followed by dedicated short bias, with a return of a 4.68%. In this case, the returns achieved by the strategies at their best months ranged from a 7.5% of the managed futures strategy to a 0.7% of the equity market neutral strategy. The following chart shows the returns achieved by the hedge funds’ strategies at their best months in the last 1, 3 and 7 years.
The returns achieved by the different strategies at their worst months are shown in the following table.

<table>
<thead>
<tr>
<th>Strategy</th>
<th>1 year</th>
<th>3 years</th>
<th>7 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>HFI</td>
<td>-4.80%</td>
<td>-1.79%</td>
<td>-6.79%</td>
</tr>
<tr>
<td>CA</td>
<td>-3.75%</td>
<td>-7.06%</td>
<td>-5.20%</td>
</tr>
<tr>
<td>DS</td>
<td>-3.27%</td>
<td>-3.93%</td>
<td>-3.88%</td>
</tr>
<tr>
<td>EM</td>
<td>-3.27%</td>
<td>-2.11%</td>
<td>-1.04%</td>
</tr>
<tr>
<td>EMN</td>
<td>-3.27%</td>
<td>-2.07%</td>
<td>-1.09%</td>
</tr>
<tr>
<td>EDF</td>
<td>-2.16%</td>
<td>-1.14%</td>
<td>-1.41%</td>
</tr>
<tr>
<td>FIA</td>
<td>-2.16%</td>
<td>-1.15%</td>
<td>-1.42%</td>
</tr>
<tr>
<td>GM</td>
<td>-1.03%</td>
<td>-0.21%</td>
<td>-0.61%</td>
</tr>
<tr>
<td>LSE</td>
<td>-1.15%</td>
<td>-0.32%</td>
<td>-0.54%</td>
</tr>
<tr>
<td>MF</td>
<td>-0.35%</td>
<td>-0.94%</td>
<td>-0.62%</td>
</tr>
<tr>
<td>Multi-strategy</td>
<td>-0.68%</td>
<td>-0.89%</td>
<td>-1.77%</td>
</tr>
</tbody>
</table>

In the last seven years, the strategy with the worst month was equity market neutral, with a loss of 40.45%, followed by fixed income arbitrage, with a loss of over a 14%. In this case, the losses posted by the different strategies at their worst months ranged from a 40.45% of the equity market neutral strategy to a 5.42% of the managed futures strategy.

On the other hand, in the last three years, the strategy with the worst month was dedicated short bias, with a loss of nearly a 7.6%, followed by managed futures, with a loss of over a 5.4%. In this case, the losses posted by the strategies at their worst months ranged from a 7.58% of the dedicated short bias strategy to a 1.14% of the fixed income arbitrage strategy.
Finally, in the last year, the strategy with the worst month was dedicated short bias, with a loss of more than 4.8%, followed by managed futures, with a loss of over 3.4%. In this period, the losses posted by the strategies at their worst months ranged from a 4.82% of the dedicated short bias strategy to a 0.1% of the fixed income arbitrage strategy. The following chart shows the returns achieved by the hedge funds’ strategies at their worst months in the last 1, 3 and 7 years.

![Chart 28: Hedge funds’ strategies worst months](chart)

Source: Compiled by author based on Credit Suisse Hedge Fund Database

The maximum drawdowns of the different strategies for the different periods analyzed, as well as their recovery times, are shown in the following tables.

### Table 66: Comparative analysis of hedge fund strategies: Maximum drawdown

<table>
<thead>
<tr>
<th></th>
<th>HH</th>
<th>CA</th>
<th>DS</th>
<th>EM</th>
<th>EMN</th>
<th>ID</th>
<th>FIA</th>
<th>GM</th>
<th>LSE</th>
<th>MF</th>
<th>Multi-strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>-0.20%</td>
<td>-1.68%</td>
<td>-7.51%</td>
<td>-2.99%</td>
<td>-1.52%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>-0.08%</td>
<td>-0.08%</td>
<td>-4.39%</td>
<td>0.00%</td>
</tr>
<tr>
<td>3 years</td>
<td>0.00%</td>
<td>0.00%</td>
<td>-4.09%</td>
<td>0.00%</td>
<td>-2.85%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>10.10%</td>
<td>0.00%</td>
</tr>
<tr>
<td>7 years</td>
<td>-19.67%</td>
<td>-31.96%</td>
<td>-41.66%</td>
<td>-41.36%</td>
<td>-43.03%</td>
<td>-18.05%</td>
<td>20.13%</td>
<td>-7.10%</td>
<td>-20.95%</td>
<td>0.00%</td>
<td>23.64%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7-year Maximum drawdown (ordered from highest to lowest)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS</td>
</tr>
<tr>
<td>7 years</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database
In the last seven years, the strategy with the largest maximum drawdown was dedicated short bias, with a 61.66% drop that was never recovered, followed by equity market neutral, with a drop of more than a 43% that was not recovered over the whole period. In this period, the maximum drawdowns ranged from a 61.66% of the dedicated short bias strategy to a 0% of the managed futures strategy. In addition, the recovery times of the maximum drawdowns ranged from the nine months of the global macro strategy to the non-recovery of the dedicated short bias and equity market neutral strategies. The following chart shows the maximum drawdowns of the hedge funds’ strategies in the last 1, 3 and 7 years.

On the other hand, in the last three years, the strategy with the largest maximum drawdown was dedicated short bias, with a 44.74% drop that was never recovered, followed by managed futures, with a 10.1% drop that was recovered in 12 months. In this case, the maximum drawdowns ranged from a 44.74% of the dedicated short bias strategy to a 0% of some strategies. In addition, the recovery times ranged from the four
months of the equity market neutral strategy to the non-recovery of the dedicated short bias strategy.

Finally, in the last year, the strategy with the largest maximum drawdown was dedicated short bias, with a 7.51% drop that was never recovered, followed by managed futures, with a 4.29% drop that was recovered in 3 months. In this case, the maximum drawdowns ranged from a 7.51% of the dedicated short bias strategy to a 0% of the event driven, multi-strategy and fixed income arbitrage strategies. In addition, the recovery times ranged from the one month of the long/short equity strategy and of the hedge fund index to the non-recovery of some strategies.

4.2.3.6 Correlation

The following table shows the correlations between the different strategies analyzed in the last seven years.

<table>
<thead>
<tr>
<th></th>
<th>CA</th>
<th>DS</th>
<th>EM</th>
<th>EMN</th>
<th>ED</th>
<th>FIA</th>
<th>GM</th>
<th>LSE</th>
<th>MF</th>
<th>Multi-strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA</td>
<td>1</td>
<td>-0.55</td>
<td>0.78</td>
<td>0.20</td>
<td>0.73</td>
<td>0.87</td>
<td>0.56</td>
<td>0.68</td>
<td>-0.09</td>
<td>0.68</td>
</tr>
<tr>
<td>DS</td>
<td>-0.55</td>
<td>1</td>
<td>-0.27</td>
<td>-0.64</td>
<td>-0.36</td>
<td>-0.07</td>
<td>-0.72</td>
<td>0.08</td>
<td>-0.49</td>
<td></td>
</tr>
<tr>
<td>EM</td>
<td>0.20</td>
<td>-0.27</td>
<td>1</td>
<td>0.83</td>
<td>0.75</td>
<td>0.59</td>
<td>0.90</td>
<td>0.11</td>
<td>-0.09</td>
<td>-0.49</td>
</tr>
<tr>
<td>EMN</td>
<td>0.73</td>
<td>-0.64</td>
<td>0.83</td>
<td>1</td>
<td>0.37</td>
<td>0.37</td>
<td>0.05</td>
<td>0.28</td>
<td>-0.04</td>
<td>0.45</td>
</tr>
<tr>
<td>ED</td>
<td>0.87</td>
<td>-0.36</td>
<td>0.75</td>
<td>0.37</td>
<td>1</td>
<td>0.63</td>
<td>0.47</td>
<td>0.89</td>
<td>0.09</td>
<td>0.66</td>
</tr>
<tr>
<td>FIA</td>
<td>0.56</td>
<td>-0.07</td>
<td>0.59</td>
<td>0.37</td>
<td>0.63</td>
<td>1</td>
<td>0.53</td>
<td>0.59</td>
<td>-0.10</td>
<td>0.81</td>
</tr>
<tr>
<td>GM</td>
<td>0.68</td>
<td>-0.72</td>
<td>0.90</td>
<td>0.05</td>
<td>0.47</td>
<td>0.53</td>
<td>1</td>
<td>0.50</td>
<td>0.55</td>
<td>0.56</td>
</tr>
<tr>
<td>LSE</td>
<td>-0.09</td>
<td>0.08</td>
<td>0.11</td>
<td>-0.04</td>
<td>0.89</td>
<td>0.59</td>
<td>0.50</td>
<td>1</td>
<td>0.15</td>
<td>0.85</td>
</tr>
<tr>
<td>MF</td>
<td>0.68</td>
<td>-0.49</td>
<td>-0.09</td>
<td>0.45</td>
<td>0.09</td>
<td>0.66</td>
<td>0.55</td>
<td>0.15</td>
<td>1</td>
<td>0.85</td>
</tr>
<tr>
<td>Multi-strategy</td>
<td>0.45</td>
<td>-0.49</td>
<td>0.45</td>
<td>0.45</td>
<td>0.66</td>
<td>0.81</td>
<td>0.56</td>
<td>0.85</td>
<td>0.85</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

As shown in the table, the convertible arbitrage strategy has had a very high positive correlation with the multi-strategy and fixed income arbitrage strategies, thanks in part to the fact that both strategies use fixed income instruments. In addition, the strategy has also had a very low correlation with the managed futures strategy, as well as a negative correlation with the dedicated short bias strategy.
The dedicated short bias strategy has had a negative correlation with almost all the strategies, except with the managed futures strategy. In the latter case, as well as with the global macro strategy, the strategy has had a very low level of correlation.

The emerging markets strategy has had a very high positive correlation with the multi-strategy and long/short equity strategies, although a low correlation with the managed futures and equity market neutral strategies. In addition, the strategy has had a negative correlation with the dedicated short bias strategy.

Moreover, the equity market neutral strategy has had, in general terms, a low correlation with the other strategies. However, its higher positive correlation was with the multi-strategy index.

The event driven strategy has had a high positive correlation with the long/short equity, multi-strategy and emerging markets strategies, as well as a significant negative correlation with the dedicated short bias strategy.

The fixed income arbitrage strategy has had a significant positive correlation with the multi-strategy and convertible arbitrage strategies, as well as a negative correlation with the dedicated short bias strategy, although not too strong.

The global macro strategy has had, in general terms, a low correlation with the other strategies analyzed although, however, its higher positive correlations have been with the emerging markets, multi-strategy and convertible arbitrage strategies.

The long/short equity strategy has had a very high positive correlation with the emerging markets, multi-strategy and event driven strategies, as well as a high negative correlation with the dedicated short bias strategy.

On the other hand, the managed futures strategy has had, in general terms, a very low correlation with the other strategies. However, its higher positive correlation was with the global macro strategy.

Finally, the multi-strategy index has had a very high positive correlation with the convertible arbitrage, emerging markets, event driven and long/short equity strategies, as well as a negative correlation with the dedicated short bias strategy. In addition, it must be highlighted that the strategy has had a very low correlation with the managed futures strategy.
4.3 ANALYSIS OF THE PERFORMANCE OF UCITS FUNDS

In this section, an analysis of the performance of the UCITS funds included in the database used in the study between 2008 and 2014 will be conducted. First, the individual performance of the main strategies implemented by UCITS funds will be analyzed. Then and, after having analyzed the individual results, a comparative analysis will be carried out. However, and before presenting the different results of the analysis conducted, it is important to know the main characteristics of the database used.

4.3.1 Main features of the database

The database used to carry out the analysis of the performance of UCITS funds between 2008 and 2014 has been the UCITS Alternative Database\(^{189}\), which belongs to Alix Capital\(^{190}\), an investment company based in Geneva (Switzerland) that specializes in regulated alternative investments. Within it, the analysis focuses in the behavior of the UCITS Alternative Benchmark Indexes. These indexes have a number of features\(^{191}\) that must be known, among which are the following.

- The weights of the different UCITS funds included in the indexes are equal or, in other words, each fund has the same relative importance in the index. In this regard, it must be noted that it would have been interesting to perform this analysis with an asset-weighted database. However, it has not been possible, since, on the one hand, the most prestigious and relevant databases of alternative UCITS funds are equally-weighted and, on the other hand, the few asset-weighted databases available do not have enough data to conduct a significant analysis.

- In order to be included in the indexes, UCITS funds must provide relevant information, such as monthly data of the performance of the fund since its inception; monthly data of assets under management of the fund since its inception; a description of the investment strategy of the fund; as well as the latest fund prospectus and the latest audit, if available.

- Benchmark Indexes are divided into a composite index, which measures the performance of the different individual indexes in aggregate terms, and 10 single indexes that measure the performance of the main strategies implemented by alternative UCITS funds. These strategies are shown in the following figure:

---

\(^{189}\) You can access to the database at the following link. However and, in order to have access to historical data, as well as to download any data, it is mandatory to be a registered user. http://www.ucits-alternative.com/

\(^{190}\) For more information about the company, you can visit its own website at the following link: http://www.alixcapital.com/

All UCITS funds that want to be included in the different indexes must meet certain conditions. In this regard, funds must comply with all the requirements included in the regulation known as UCITS III (Management Directive and Product Directive) or in a greater regulation; have an absolute return investment strategy; and publish the fund NAV on a daily, weekly or bi-monthly basis.

In cases in which a fund has different share classes, priority will be given to the share class denominated in euros that charges the lowest fees and with the higher volume of assets under management. If the fund does not have any share class denominated in euros, the share class that charges the lowest fees and with the highest volume of assets under management will be used.

If any fund does not report the required information to the index provider (Alix Capital), it will be excluded from the index. Also, all funds that are removed from an index will not be eligible for re-inclusion into the index.

Finally, it must be noted that all the index calculations are made in EUR, so in those cases in which it is necessary to transform data of assets under management denominated in a currency other than the EUR, the value in the local currency will be multiplied by the existing exchange rate between that currency and the EUR.

### 4.3.2 Individual analysis of the performance of the different strategies

In this section, the individual performance of the different strategies implemented by alternative UCITS funds will be analyzed. The metrics used in the analysis are shown in the following figure.
Also, it must be noted that each metric has been calculated for the last 1, 3 and 7 years. In this regard, the periods analyzed refer to the following dates:


Finally, it must be highlighted that the Sharpe and Treynor ratios of the several alternative UCITS indexes have been calculated by using as risk free rate the 90-days Treasury-Bill rate of the 17-01-2015, which was of a 0.025%. In addition, the betas of the different strategies have been calculated by using the S&P 500 Index as a proxy of the equity market. In this regard, it must be said that it has been used the S&P 500 Index because it is widely used by practitioners when calculating beta, as it is considered a good representative of the US equity market. This aspect also facilitates comparisons with the results/conclusions of other similar studies.

### 4.3.2.1 UCITS Alternative Index Global

The main data of the performance of the UCITS Alternative Index Global, which is an aggregate of the various strategies implemented by UCITS funds, during the period analyzed are included in the following table:

<table>
<thead>
<tr>
<th></th>
<th>1 year</th>
<th>3 years</th>
<th>7 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return (total)</td>
<td>1.80%</td>
<td>5.88%</td>
<td>8.13%</td>
</tr>
<tr>
<td>Return (annualized)</td>
<td>1.80%</td>
<td>1.92%</td>
<td>1.12%</td>
</tr>
<tr>
<td>Volatility (monthly)</td>
<td>0.55%</td>
<td>0.65%</td>
<td>0.59%</td>
</tr>
<tr>
<td>Volatility (annualized)</td>
<td>1.90%</td>
<td>2.24%</td>
<td>3.43%</td>
</tr>
<tr>
<td>Sharpe ratio</td>
<td>0.94</td>
<td>0.85</td>
<td>0.42</td>
</tr>
<tr>
<td>Treynor ratio</td>
<td>-0.12</td>
<td>-0.074</td>
<td>0.26</td>
</tr>
<tr>
<td>Beta</td>
<td>-0.15</td>
<td>-0.03</td>
<td>0.04</td>
</tr>
</tbody>
</table>

*Source: Compiled by author based on data from the Alex Capital UCITS Alternative Database*

As shown above, the index achieved a total return of more than an 8.1% between 2008 and 2014, and of a 1.12% on an annualized basis. In addition, it must be highlighted that the annualized return achieved in the last 1 and 3 years is higher compared with that of the last 7 years, which is something that can be explained in part due to the end of the international financial crisis that began in late 2007.

In comparative terms, the following chart shows the evolution of the UCITS index during the period analyzed compared to the main benchmark of the American equity market.
market, the S&P 500. As can be seen, the returns achieved by the UAI Global have been higher than the ones of the S&P 500 throughout the crisis period but, since mid-2012, the situation changed.

![Chart 30: UAI Global vs S&P 500](chart30.png)

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database

Also, the annualized volatility of the UAI Global in the last 7 years stood at a 3.43%, a high level that is explained again by the turbulences caused by the aforementioned financial crisis. However, and after the end of the crisis, the annualized volatility of the index fell to a level of a 2.24% in the last 3 years; and to a level of a 1.9% in the last year.

On the other hand, and in terms of risk-adjusted return, the 7-year Sharpe ratio stood at 0.32, indicating that the index offered about 0.32 percentage points of net returns for each percentage point of total risk assumed. In addition, the Treynor ratio stood at 0.26, indicating that the index offered approximately 0.26 percentage points of net returns for each percentage point of non-diversifiable risk assumed.

Along with the above statistics, the 7-year beta of the index stood at a level close to zero, indicating that the index has had a very low correlation with market movements during the period. This aspect explains one of the objectives of alternative UCITS, which seek to achieve attractive returns regardless of the market movements.

The following table includes other important performance statistics of the index:
As shown above, at its best month in the last 7 years, the index achieved a return of around a 2.2%; while at its worst month, it suffered a drop of almost a 4%. In addition, the maximum drawdown was of around an 8.2%, which was recovered in 10 months.

### 4.3.2.2 UCITS Alternative Index Volatility

The main metrics calculated for the period analyzed of the volatility strategy are shown in the following table.

<table>
<thead>
<tr>
<th>Table 70: UCITS Alternative Index Global (Other performance metrics)</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Table" /></td>
</tr>
<tr>
<td>Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database</td>
</tr>
</tbody>
</table>

Over the seven years analyzed, the strategy achieved a return of almost a 14.5%, which in annualized terms translates into a return of a 1.95%. This aspect is particularly relevant when taking into account the international financial crisis that took place during the period analyzed. However, the strategy posted losses of a 5.3% in the last 3 years; and of around a 1% in the last year.

When compared with the S&P 500 Index, the volatility strategy has had a superior performance in almost all the analyzed period, although it underperformed the equity index since late 2013, as can be seen in the following chart.

<table>
<thead>
<tr>
<th>Table 71: UAI Volatility (Main performance metrics)</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Table" /></td>
</tr>
<tr>
<td>Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database</td>
</tr>
</tbody>
</table>

292
On the other hand, the annualized volatility of the strategy has been of a 2.9% in the last 7 years. However, the annualized volatility fell to a level of a 1.53% in the last 3 years; and to a level of around a 1% in the last year.

In terms of risk-adjusted return, the Sharpe ratio of the strategy in the last seven years was of 0.66, so the strategy offered 0.66 percentage points of net returns for each percentage point of total risk assumed; while the Treynor ratio was of -0.45, indicating that the strategy posted 0.45 percentage points of net losses for each percentage point of market risk taken. In addition, the beta of the strategy for the entire period was of -0.04, indicating that the strategy has had little correlation with market movements during the period.

The following table lists other important metrics of the strategy for the period analyzed.

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Best Month</th>
<th>Worst Month</th>
<th>Maximum Drawdown</th>
<th>Recovery Time (Months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>0.49%</td>
<td>-0.69%</td>
<td>-1.54%</td>
<td>N/A</td>
</tr>
<tr>
<td>3 years</td>
<td>1.03%</td>
<td>-1.41%</td>
<td>-5.75%</td>
<td>N/A</td>
</tr>
<tr>
<td>7 years</td>
<td>2.89%</td>
<td>-1.70%</td>
<td>0.00%</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database
As can be seen, at its best month in the last seven years, the strategy achieved a return of around 2.9%, while at its worst month, it posted a loss of a 1.7%. In addition, the strategy has had no maximum drawdown in the last seven years, although if the period analyzed is restricted exclusively to the last three years, the maximum drawdown was of a 5.75%, which has not been recovered yet.

Finally, it must be noted that the strategy has had negative correlations, although not very significant, with all the strategies, except with the CTA strategy, as reflected in the following table.

<table>
<thead>
<tr>
<th>Correlation</th>
<th>FoF</th>
<th>EM</th>
<th>EMN</th>
<th>ED</th>
<th>FI</th>
<th>M</th>
<th>L/SE</th>
<th>CTA</th>
<th>Multi-strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>-0.47</td>
<td>-0.48</td>
<td>-0.26</td>
<td>-0.44</td>
<td>-0.45</td>
<td>-0.36</td>
<td>-0.52</td>
<td>0.13</td>
<td>-0.30</td>
<td></td>
</tr>
</tbody>
</table>

4.3.2.3 UCITS Alternative Index Funds of Funds

The main performance statistics of this strategy for the period analyzed are shown in the following table.

<table>
<thead>
<tr>
<th>Return (total)</th>
<th>Return (annualized)</th>
<th>Volatility (monthly)</th>
<th>Volatility (annualized)</th>
<th>Sharpe ratio</th>
<th>Treynor ratio</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>0.36%</td>
<td>0.36%</td>
<td>0.66%</td>
<td>2.27%</td>
<td>0.15</td>
<td>-0.02</td>
</tr>
<tr>
<td>3 years</td>
<td>3.00%</td>
<td>0.99%</td>
<td>0.75%</td>
<td>2.60%</td>
<td>0.37</td>
<td>-0.27</td>
</tr>
<tr>
<td>7 years</td>
<td>-11.15%</td>
<td>-1.73%</td>
<td>1.01%</td>
<td>3.49%</td>
<td>-0.50</td>
<td>-0.46</td>
</tr>
</tbody>
</table>

This strategy has had losses of more than an 11.5% in the last seven years; although it recovered in the last 1 and 3 years, in which it achieved returns of a 0.36% and of a 3%. In annualized terms, the losses were of more than a 1.7% in the last 7 years; while the returns achieved were of almost a 1% in the last 3 years.

Compared with the S&P 500 Index, the strategy performed better during the years of the crisis, although the situation reverted since mid-2011, as can be seen in the following chart.
In terms of risk, the annualized volatility of the strategy was of almost a 3.5% in the last seven years; of a 2.6% in the last 3 years; and of almost a 2.3% in the last year.

On the other hand, the risk-adjusted return of the strategy has been very low in the seven years analyzed, as indicated by its negative Sharpe ratio. In this regard, the strategy posted a net loss of 0.5 percentage points for each percentage point of total risk assumed. In addition, the Treynor ratio also took a negative value, indicating that the strategy posted a net loss of 0.46 percentage points for each unit of market risk taken. Along with this, the beta of the strategy stood at a level close to zero.

Other important performance metrics of the strategy are shown in the following table.

<table>
<thead>
<tr>
<th></th>
<th>1 year</th>
<th>3 years</th>
<th>7 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Best month</td>
<td>1.17%</td>
<td>1.31%</td>
<td>1.31%</td>
</tr>
<tr>
<td>Worst month</td>
<td>-1.25%</td>
<td>-1.85%</td>
<td>-5.16%</td>
</tr>
<tr>
<td>Maximum drawdown</td>
<td>-0.92%</td>
<td>-2.40%</td>
<td>-17.57%</td>
</tr>
<tr>
<td>Recovery time (months)</td>
<td>1</td>
<td>8</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database
At its best month, the strategy achieved a return of more than a 1.3% in the last 7 years; of more than a 1.3% in the last three years; and of nearly a 1.2% in the last year. In addition, at its worst month, the strategy posted a loss of almost a 5.2% in the last seven years; of a 1.85% in the last three years; and of a 1.25% in the last year. Furthermore, the maximum drawdown in the entire period was of almost a 17.6%, which has not been recovered yet.

Finally, it must be noted that the strategy has had a high positive correlation with the macro, long/short equity, fixed income and event driven strategies; as well as a negative correlation with the volatility strategy, as can be seen in the following table.

<table>
<thead>
<tr>
<th>Table 76: UAI Funds of Funds (Correlation with other strategies)</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Table Image" /></td>
</tr>
<tr>
<td>Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database</td>
</tr>
</tbody>
</table>

**4.3.2.4 UCITS Alternative Index Emerging Markets**

The following table summarizes the main results obtained after having analyzed the UAI Emerging Markets.

<table>
<thead>
<tr>
<th>Table 77: UAI Emerging Markets (Main performance metrics)</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Table Image" /></td>
</tr>
<tr>
<td>Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database</td>
</tr>
</tbody>
</table>

The total return of the strategy over the period analyzed was of around a 13.2%, a very acceptable level considering the crisis that began in late 2007. The strategy also performed well over the last three years, in which achieved a total return of more than a 2.5%. In annualized terms, the return was of almost a 1.8% in the last seven years; of almost a 0.85% in the last three years; and of a 1.5% in the last year.

Compared with the main benchmark of the American equity market, the S&P 500, the strategy performed better over the years of the crisis, although the situation reverted since late 2012, as can be seen in the following chart.
The annualized volatility of the strategy has been high, as it stood at a level of around a 9.8% in the last seven years; of more than a 5.1% in the last three years; and of more than a 4% in the last year.

On the other hand, the risk-adjusted return of the strategy was relatively low throughout the period analyzed, as the Sharpe ratio was of 0.18 in the last seven years, in the same way that the Treynor ratio was of 0.16. In this regard, the strategy offered 0.18 percentage points of net returns for each percentage point of total risk assumed, and 0.16 percentage points of net returns for each percentage point of market risk taken. Furthermore, the beta of the strategy was of 0.11, so its correlation with market movements was low during the period.

At its best month, the strategy posted a return of nearly an 8.5% in the last seven years, while, at its worst month, it posted a loss of more than a 10.4%. Along with this, the maximum drawdown of the strategy was of almost a 21.9%, which was recovered in 8 months, as shown in the following table.
Finally, it must be said that the strategy has had a high positive correlation with the long/short/equity, macro, fixed income and event driven strategies; a negative correlation with the volatility strategy; as well as no correlation with the CTA strategy, as shown in the following table.

### Table 78: UAI Emerging Markets (Other performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>Best month</th>
<th>Worst month</th>
<th>Maximum drawdown</th>
<th>Recovery time (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>1.80%</td>
<td>-2.05%</td>
<td>-2.05%</td>
<td>5</td>
</tr>
<tr>
<td>3 years</td>
<td>4.05%</td>
<td>-3.68%</td>
<td>0.00%</td>
<td>N/A</td>
</tr>
<tr>
<td>7 years</td>
<td>8.48%</td>
<td>-10.43%</td>
<td>-21.87%</td>
<td>8</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database

4.3.2.5 UCITS Alternative Index Equity Market Neutral

The main statistics of this strategy for the period analyzed are included in the following table.

### Table 79: UAI Emerging Markets (Correlation with other strategies)

<table>
<thead>
<tr>
<th></th>
<th>V</th>
<th>FoF</th>
<th>EMN</th>
<th>ED</th>
<th>FI</th>
<th>M</th>
<th>L/SE</th>
<th>CTA</th>
<th>Multi-strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correlation</td>
<td>-0.48</td>
<td>0.67</td>
<td>0.33</td>
<td>0.71</td>
<td>0.81</td>
<td>0.82</td>
<td>0.85</td>
<td>-0.002</td>
<td>0.31</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database

As can be seen, the overall performance of the strategy in the last seven years has been bad, as it posted a loss of over a 2.3%. However, the strategy achieved a return of more than a 1.5% in the last three years, as well as of a 0.1% in the last year. In annualized terms, the strategy posted a loss of more than a 0.3% in the last seven years; and achieved a positive return of a 0.5% in the last three years.

### Table 80: UAI Equity Market Neutral (Main performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>Return (total)</th>
<th>Return (annualized)</th>
<th>Volatility (monthly)</th>
<th>Volatility (annualized)</th>
<th>Sharpe ratio</th>
<th>Treynor ratio</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>0.10%</td>
<td>0.10%</td>
<td>0.43%</td>
<td>1.48%</td>
<td>0.05</td>
<td>-0.05</td>
<td>-0.014</td>
</tr>
<tr>
<td>3 years</td>
<td>1.51%</td>
<td>0.50%</td>
<td>0.39%</td>
<td>1.35%</td>
<td>0.35</td>
<td>0.56</td>
<td>0.01</td>
</tr>
<tr>
<td>7 years</td>
<td>-2.33%</td>
<td>-0.34%</td>
<td>0.55%</td>
<td>1.89%</td>
<td>-0.19</td>
<td>-0.07</td>
<td>0.003</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database
Compared with the main benchmark of the American equity market, the S&P 500, the strategy performed better during the financial crisis, although the situation reverted since early 2012, as can be seen in the following chart.

The annualized volatility of the strategy has been relatively low during the period analyzed, as it stood at a level of around a 1.9% in the last 7 years; of a 1.35% in the last 3 years; and of around a 1.5% in the last year.

In terms of risk-adjusted returns, the Sharpe ratio was of -0.19 in the last seven years, indicating that the strategy posted a net loss of 0.19 percentage points for each percentage point of total risk assumed; while the Treynor ratio was of -1.07, indicating that the strategy posted a net loss of 1.07 percentage points for each percentage point of market risk taken. In addition, the beta of the strategy in the last seven years stood at a level close to zero.

The following table includes other relevant statistics of the strategy for the period analyzed.
In the last seven years, the strategy achieved a return of more than a 1.2% at its best month; of more than a 0.7% in the last three years; and of more than a 0.5% in the last year. However, at its worst month, the strategy posted a loss of over a 2.5% in the last seven years; of approximately a 0.9% in the last three years; and of a 0.89% in the last year. Furthermore, the maximum drawdown in the last seven years was of over a 5.4%, which has not been recovered yet.

Finally, it must be noted that, in general terms, the strategy has had a relatively low level of correlation with other strategies, as can be seen in the following table. In this regard, the higher positive correlation of the strategy was with the long/short equity strategy. In addition, the strategy has had a negative correlation with the volatility strategy.

### Table 81: UAI Equity Market Neutral (Other performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>Best month</th>
<th>Worst month</th>
<th>Maximum drawdown</th>
<th>Recovery time (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>0.51%</td>
<td>-0.89%</td>
<td>-0.74%</td>
<td>4</td>
</tr>
<tr>
<td>3 years</td>
<td>0.71%</td>
<td>-0.89%</td>
<td>-1.50%</td>
<td>15</td>
</tr>
<tr>
<td>7 years</td>
<td>1.22%</td>
<td>-2.54%</td>
<td>-5.46%</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database

4.3.2.6 UCITS Alternative Index Event Driven

The main metrics calculated for the period analyzed of the event driven strategy are shown in the following table.

### Table 83: UAI Event Driven (Main performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>Return (total)</th>
<th>Return (annualized)</th>
<th>Volatility (monthly)</th>
<th>Volatility (annualized)</th>
<th>Sharpe ratio</th>
<th>Treasury ratio</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>-1.76%</td>
<td>-1.76%</td>
<td>0.89%</td>
<td>2.78%</td>
<td>-0.64</td>
<td>0.10</td>
<td>-0.18</td>
</tr>
<tr>
<td>3 years</td>
<td>0.78%</td>
<td>0.25%</td>
<td>0.85%</td>
<td>2.95%</td>
<td>0.08</td>
<td>0.16</td>
<td>-0.01</td>
</tr>
<tr>
<td>7 years</td>
<td>4.00%</td>
<td>0.56%</td>
<td>1.06%</td>
<td>3.69%</td>
<td>0.15</td>
<td>0.10</td>
<td>0.05</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database
The total return of the strategy over the last seven years has been of a 4%, which is a very positive performance given the circumstances of the period. Moreover, in the last three years, the strategy achieved a return of almost a 0.8%, although in the last year the strategy posted a loss of a 1.76%. In annualized terms, the strategy achieved a return of a 0.56% in the last seven years; as well as of a 0.26% in the last three years.

Compared with the S&P 500 Index, the strategy performed better during the years of the crisis, although the trend reverted since late 2012, as can be seen in the following graph.

Moreover, the annualized volatility of the strategy over the last seven years was of approximately a 3.7%; of almost a 3% in the last three years; and of around a 2.8% in the last year.

In terms of risk-adjusted return, the Sharpe ratio of the strategy was of 0.15 in the last seven years, so it offered a net return of 0.15 percentage points for each percentage point of total risk assumed; while its Treynor ratio was of 0.1, indicating that it offered a net return of 0.1 percentage points for each percentage point of market risk taken. In addition, the beta of the strategy over the past seven years stood at a level close to zero.

The following table lists other important metrics used to measure the performance of the strategy over the period analyzed.
At its best month, the strategy achieved a return of almost a 2.2% in the last seven years; of more than a 1.5% in the last three years; and of more than a 1% in the last year. Furthermore, at its worst month, the strategy posted a loss of almost a 4.6% in the last seven years; of more than a 1.9% in the last three years; and of a 1.94% in the last year. In addition, the maximum drawdown in the period analyzed was of an 8.36%, which was recovered in 21 months.

Finally, the strategy has had a high positive correlation with the long/short equity, macro, funds of funds and emerging markets strategies; a negative correlation with the volatility strategy; as well as no correlation with the CTA strategy, as shown below.

### Table 85: UAI Event Driven (Correlation with other strategies)

<table>
<thead>
<tr>
<th></th>
<th>V</th>
<th>FoF</th>
<th>EM</th>
<th>FMN</th>
<th>FI</th>
<th>M</th>
<th>L/SE</th>
<th>CTA</th>
<th>Multi-strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correlation</td>
<td>-0.44</td>
<td>0.72</td>
<td>0.71</td>
<td>0.34</td>
<td>0.70</td>
<td>0.74</td>
<td>0.80</td>
<td>-0.005</td>
<td>0.35</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database

#### 4.3.2.7 UCITS Alternative Index Fixed Income

The following table summarizes the main results obtained after having analyzed the UAI Fixed Income.

### Table 86: UAI Fixed Income (Main performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>Return (total)</th>
<th>Return (annualized)</th>
<th>Volatility (monthly)</th>
<th>Volatility (annualized)</th>
<th>Sharpe ratio</th>
<th>Treynor ratio</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>0.73%</td>
<td>0.73%</td>
<td>0.24%</td>
<td>0.83%</td>
<td>0.85</td>
<td>0.81</td>
<td>0.009</td>
</tr>
<tr>
<td>3 years</td>
<td>6.88%</td>
<td>2.24%</td>
<td>0.33%</td>
<td>1.13%</td>
<td>1.96</td>
<td>9.86</td>
<td>0.002</td>
</tr>
<tr>
<td>7 years</td>
<td>15.74%</td>
<td>2.11%</td>
<td>0.83%</td>
<td>2.87%</td>
<td>0.73</td>
<td>0.48</td>
<td>0.04</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database
The total return of the strategy has been of over a 15.7% in the last seven years; of almost a 6.9% in the last three years; and of more than a 0.7% in the last year, indicating that the strategy performed very well throughout the period analyzed. In annualized terms, the strategy achieved a return of over a 2.1% in the last seven years; and of more than a 2.2% in the last three years.

Compared with the S&P 500 Index, the strategy achieved higher returns during the years of the crisis, although the trend reverted since mid-2013, as can be seen in the following graph.

Moreover, the annualized volatility of the strategy was of almost a 2.9% in the last seven years; of more than a 1.1% in the last three years; and of over a 0.8% in the last year.

In terms of risk-adjusted return, the Sharpe ratio of the strategy in the last seven years was of 0.73, so the strategy offered 0.73 percentage points of net returns for each percentage point of total risk assumed; while the Treynor ratio was of 0.48, indicating that the strategy offered 0.48 percentage points of net returns for each percentage point of market risk taken. In addition, the beta of the strategy in the last 7 years was of 0.04, indicating a low correlation of the strategy with market movements.
The following table lists other important statistics of the strategy analyzed.

![Table 87: UAI Fixed Income (Other performance metrics)](image)

At its best month, the strategy achieved a return of over a 2% in the last seven years; of almost a 1% in the last three years; and of a 0.45% in the last year. Furthermore, at its worst month, the strategy posted a loss of almost a 4.6% in the last seven years; of almost a 0.7% in the last three years; and of almost a 0.4% in the last year. In addition, the maximum drawdown in the last 7 years was of a 7.65%, which was recovered in 5 months.

Finally, it must be said that the strategy has had a high positive correlation with the emerging markets, macro, long/short equity and funds of funds strategies; a negative correlation with the volatility strategy; as well as no correlation with the CTA strategy, as can be seen in the following table.

![Table 88: UAI Fixed Income (Correlation with other strategies)](image)

### 4.3.2.8 UCITS Alternative Index Macro

The main performance metrics of this strategy for the period analyzed are included in the following table.

![Table 89: UAI Macro (Main performance metrics)](image)
The total return achieved by the strategy was of almost a 7.8% in the last seven years; of more than a 4.2% in the last three years; and of almost a 2.3% in the last year. In annualized terms, the strategy achieved a return of almost a 1.1% in the last seven years; and of nearly a 1.4% in the last three years.

Compared with the S&P 500 Index, the strategy performed better during the financial crisis, although in late 2012 the trend reverted, as can be seen in the following chart.

![Chart 37: UAI Macro vs S&P 500](image)

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database

On the other hand, the annualized volatility of the strategy was of a 3.4% in the last seven years; of more than a 2.5% in the last three years; and of more than a 1.9% in the last year.

In terms of risk-adjusted return, the Sharpe ratio of the strategy in the last seven years was of 0.31, so the strategy offered 0.31 percentage points of net returns for each percentage point of total risk assumed; while its Treynor ratio was of 0.24, indicating that the strategy offered 0.24 percentage points of net returns for each percentage point of market risk taken. Also, the beta of the strategy over the past seven years stood at a level close to zero.

The following table lists other important metrics of the strategy analyzed.
At its best month, the strategy achieved a return of more than a 2.4% in the last seven years; of a 1.7% in the last three years; and of more than a 1.1% in the last year. Furthermore, at its worst month, the strategy posted a loss of almost a 3.9% in the last seven years; of a 2.15% in the last three years; and of almost a 0.6% in the last year. In addition, the maximum drawdown in the last seven years was of more than an 8.3%, which was recovered in 9 months.

Finally, the strategy has had high positive correlations with the long/short equity, funds of funds, emerging markets, fixed income and event driven strategies; as well as a negative correlation with the volatility strategy, as shown in the following table.

### Table 91: UAI Macro (Correlation with other strategies)

<table>
<thead>
<tr>
<th>Correlation</th>
<th>V Lo</th>
<th>FoF</th>
<th>EM</th>
<th>EMN</th>
<th>ED</th>
<th>FI</th>
<th>LSE</th>
<th>CTA</th>
<th>Multi-strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>V Lo</td>
<td>0.36</td>
<td>0.83</td>
<td>0.82</td>
<td>0.36</td>
<td>0.74</td>
<td>0.81</td>
<td>0.90</td>
<td>0.23</td>
<td>0.48</td>
</tr>
<tr>
<td>Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**4.3.2.9 UCITS Alternative Index Long/Short Equity**

The main metrics calculated for the period analyzed of the long/short equity strategy are shown in the following table.

### Table 92: UAI Long/Short Equity (Main performance metrics)

<table>
<thead>
<tr>
<th>Year</th>
<th>Return (total)</th>
<th>Return (annualized)</th>
<th>Volatility (monthly)</th>
<th>Volatility (annualized)</th>
<th>Sharpe ratio</th>
<th>Treynor ratio</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>1.16%</td>
<td>1.16%</td>
<td>0.87%</td>
<td>3.00%</td>
<td>0.48</td>
<td>-0.07</td>
<td>-0.20</td>
</tr>
<tr>
<td>3 years</td>
<td>13.70%</td>
<td>4.37%</td>
<td>1.01%</td>
<td>3.51%</td>
<td>1.24</td>
<td>-0.61</td>
<td>-0.071</td>
</tr>
<tr>
<td>5 years</td>
<td>14.91%</td>
<td>2.00%</td>
<td>1.46%</td>
<td>5.96%</td>
<td>0.39</td>
<td>0.33</td>
<td>0.06</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database
The total return of the strategy was of more than a 14.9% in the last seven years; of a 13.7% in the last three years; and of around a 1.5% in the last year. In annualized terms, the strategy achieved a return of a 2% in the last seven years; and of almost a 4.4% in the last three years.

Compared with the main benchmark of the American equity market, the S&P 500, the strategy performed better during the international financial crisis, although the trend reverted in mid-2012, as can be seen in the following chart.

On the other hand, the strategy has had an annualized volatility of more than a 5% in the last seven years; of over a 3.5% in the last three years; and of a 3% in the last year.

In terms of risk-adjusted returns, the Sharpe ratio of the strategy in the last seven years was of 0.39, indicating that it offered 0.39 percentage points of net returns for each percentage point of total risk assumed; while its Treynor ratio was of 0.33, indicating that the strategy offered 0.33 percentage points of net returns for each percentage point of market risk taken. In addition, the beta of the strategy in the last seven years was of 0.06.

The following table includes other performance metrics of the strategy for the period analyzed.
At its best month, the strategy achieved a return of almost a 3.3% in the last seven years; of more than a 2.2% in the last three years; and of a 2.14% in the last year. Furthermore, at its worst month, the strategy posted a loss of approximately a 5.1% in the last seven years; of a 2.4% in the last three years; and of nearly a 1% in the last year. In addition, the maximum drawdown in the last seven years was of more than a 12.8%, which was recovered in 13 months.

Finally, it must be noted that the strategy has had a high positive correlation with the macro, emerging markets, funds of funds, event driven and fixed income strategies; a negative correlation with the volatility strategy; as well as no correlation with the CTA strategy, as shown in the following table.

### Table 93: UAI Long/Short Equity (Other performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>Best month</th>
<th>Worst month</th>
<th>Maximum drawdown</th>
<th>Recovery time (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>2.14%</td>
<td>-0.98%</td>
<td>-0.09%</td>
<td>1</td>
</tr>
<tr>
<td>3 years</td>
<td>2.21%</td>
<td>-2.40%</td>
<td>-0.61%</td>
<td>2</td>
</tr>
<tr>
<td>7 years</td>
<td>3.28%</td>
<td>-5.07%</td>
<td>-12.83%</td>
<td>13</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database

4.3.2.10 UCITS Alternative Index CTA

The main performance metrics of this strategy for the period analyzed are shown in the following table.

### Table 94: UAI Long/Short Equity (Correlation with other strategies)

<table>
<thead>
<tr>
<th></th>
<th>V</th>
<th>FoF</th>
<th>EM</th>
<th>EMN</th>
<th>ED</th>
<th>Fl</th>
<th>M</th>
<th>CTA</th>
<th>Multi-strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correlation</td>
<td>-0.52</td>
<td>0.83</td>
<td>0.85</td>
<td>0.50</td>
<td>0.89</td>
<td>0.78</td>
<td>0.90</td>
<td>0.06</td>
<td>0.40</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database

### Table 95: UAI CTA (Main performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>Return (total)</th>
<th>Return (annualized)</th>
<th>Volatility (monthly)</th>
<th>Volatility (annualized)</th>
<th>Sharpe ratio</th>
<th>Treynor ratio</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>12.75%</td>
<td>12.75%</td>
<td>1.71%</td>
<td>5.93%</td>
<td>2.15</td>
<td>-0.22</td>
<td>-0.59</td>
</tr>
<tr>
<td>3 years</td>
<td>7.17%</td>
<td>2.34%</td>
<td>1.61%</td>
<td>5.59%</td>
<td>0.41</td>
<td>-0.41</td>
<td>-0.06</td>
</tr>
<tr>
<td>7 years</td>
<td>13.69%</td>
<td>1.85%</td>
<td>1.44%</td>
<td>5.00%</td>
<td>0.36</td>
<td>-0.49</td>
<td>-0.04</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database
The total return of the strategy was of around a 13.7% in the last seven years; of almost a 7.2% in the last three years; and of a 12.75% in the last year. In this regard, it must be noted that the strategy performed very well over the period analyzed. In annualized terms, the strategy achieved a return of a 1.85% in the last seven years; as well as of more than a 2.3% in the last three years.

Compared with the S&P 500 Index, the strategy performed better during the international financial crisis, although the trend reverted in mid-2013, as shown in the following chart.

![Chart 39: UAI CTA vs S&P 500](image)

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database

Moreover, the annualized volatility of the strategy was of a 5% in the last seven years; of almost a 5.6% in the last three years; as well as of more than a 5.9% in the last year. In this regard, it must be noted that the strategy has had a high volatility throughout the period analyzed.

In terms of risk-adjusted returns, the Sharpe ratio of the strategy in the last 7 years was of 0.36, indicating that it offered 0.36 percentage points of net returns for each percentage point of total risk assumed. On the other hand, the strategy had a negative Treynor ratio of 0.49, indicating that it posted a net loss of 0.49 percentage points for each percentage point of market risk taken. In addition, the beta of the strategy stood at a negative level, although very close to zero.

The following table lists other important metrics used to measure the performance of the strategy over the period analyzed.
At its best month, the strategy achieved a return of a 4.07% in the last 1, 3 and 7 years; while at its worst month, it posted a loss of a 2.85% in the last 3 and 7 years, and of a 2.3% in the last year. In addition, the strategy has had no maximum drawdown in the last seven years, although if the period analyzed is restricted exclusively to the last three years, the maximum drawdown was of almost a 6.1%, which was recovered in 11 months.

Finally, it must be noted that the strategy does not present significant correlations with any of the strategies analyzed so far. However, the highest positive correlation is achieved with the multi-strategy index. In addition, the strategy achieves close to zero correlations with the emerging markets, event driven, long/short equity and fixed income strategies, as can be seen in the following table.

### 4.3.2.11 UCITS Alternative Index Multi-Strategy

The main performance metrics of the last of the strategies analyzed are listed in the following table.
The total return of the strategy was of more than a 10.5% in the last seven years; of more than a 10.6% in the last three years; and of more than a 2.2% in the last year. In this regard, it must be noted that UCITS funds specialized in the implementation of several strategies have had a very good performance throughout the period analyzed. In annualized terms, the strategy achieved a return of a 1.44% in the last seven years; and of more than a 3.4% in the last three years.

Compared with the S&P 500 Index, the strategy performed better during the international financial crisis, although the trend reverted since late 2012, as can be seen in the following chart.

![Chart 40: UAI Multi-Strategy vs S&P 500](source)

On the other hand, the annualized volatility of the strategy was of more than a 2.7% in the last seven years; of over a 2.2% in the last three years; and of around a 2.1% in the last year.

In terms of risk-adjusted returns, the 7-year Sharpe ratio of the strategy was of 0.52, so it offered 0.52 percentage points of net returns for each percentage point of total risk assumed; while the Treynor ratio was of 7.51, indicating that the strategy offered 7.51 percentage points of net returns for each percentage point of market risk taken. In addition, the beta of the strategy in the last seven years was of almost zero, indicating that the strategy has had a low correlation with market movements.
The following table lists other important statistics of the strategy analyzed.

<table>
<thead>
<tr>
<th></th>
<th>Best month</th>
<th>Worst month</th>
<th>Maximum drawdown</th>
<th>Recovery time (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>1.06%</td>
<td>-1.12%</td>
<td>-0.42%</td>
<td>2</td>
</tr>
<tr>
<td>3 years</td>
<td>1.54%</td>
<td>-1.34%</td>
<td>0.00%</td>
<td>N/A</td>
</tr>
<tr>
<td>7 years</td>
<td>2.33%</td>
<td>-2.60%</td>
<td>0.00%</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database

At its best month, the strategy achieved a return of more than a 2.3% in the last seven years; of more than a 1.5% in the last three years; and of over a 1% in the last year. Furthermore, at its worst month, the strategy posted a loss of a 2.6% in the last seven years; of more than a 1.3% in the last three years; as well as of more than a 1.1% in the last year. In addition, the strategy has had no maximum drawdown in the last 3 and 7 years, although if the period analyzed is restricted exclusively to the last year, the maximum drawdown was of more than a 0.4%, which was recovered in 2 months.

Finally, it must be noted that the strategy has had a significant positive correlation with the funds of funds strategy, as well as a negative correlation with the volatility strategy, as shown in the following table.

<table>
<thead>
<tr>
<th>Correlation</th>
<th>V</th>
<th>FoF</th>
<th>EM</th>
<th>EMN</th>
<th>ED</th>
<th>FI</th>
<th>M</th>
<th>L/SE</th>
<th>CTA</th>
</tr>
</thead>
<tbody>
<tr>
<td>-0.30</td>
<td>0.52</td>
<td>0.31</td>
<td>0.31</td>
<td>0.35</td>
<td>0.37</td>
<td>0.48</td>
<td>0.40</td>
<td>0.34</td>
<td></td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database

**4.3.3 Comparative analysis of the performance of UCITS funds strategies**

After having analyzed the performance of the different strategies implemented by UCITS funds on an individual basis, it is time to carry out a comparative analysis between strategies.

**4.3.3.1 Returns**

The following tables show the returns achieved by the different strategies analyzed, in total and in annualized terms. Also, the tables include the 7-year returns of the strategies ordered from highest to lowest, since the longer the period analyzed, the more representative will be the analysis and the conclusions reached.
In the last seven years, the fixed income strategy achieved the highest return, in total and in annualized terms, followed by the long/short equity and volatility strategies; while the least profitable strategy has been funds of funds, followed by equity market neutral, being the only two strategies that posted losses during the period. In this regard, the total return of the strategies in the last seven years has ranged from a loss of an 11.51% of the funds of funds strategy to a gain of a 15.74% of the fixed income strategy. On the other hand, and in annualized terms, the returns ranged from a loss of a 1.73% of the funds of funds strategy to a gain of nearly a 2.11% of the fixed income strategy, as can be seen in the following table.

### Table 101: Comparative analysis of alternative UCITS strategies: Return (total)

<table>
<thead>
<tr>
<th></th>
<th>UAIG</th>
<th>V</th>
<th>FoF</th>
<th>EM</th>
<th>EMN</th>
<th>ED</th>
<th>M</th>
<th>LSE</th>
<th>CTA</th>
<th>Multi-strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>1.80%</td>
<td>-0.97%</td>
<td>4.00%</td>
<td>1.59%</td>
<td>0.10%</td>
<td>-1.76%</td>
<td>0.75%</td>
<td>2.29%</td>
<td>1.46%</td>
<td>11.75%</td>
</tr>
<tr>
<td>3 years</td>
<td>5.88%</td>
<td>-5.20%</td>
<td>3.00%</td>
<td>1.54%</td>
<td>1.21%</td>
<td>0.78%</td>
<td>0.88%</td>
<td>4.21%</td>
<td>15.79%</td>
<td>7.17%</td>
</tr>
<tr>
<td>7 years</td>
<td>8.13%</td>
<td>14.07%</td>
<td>-11.51%</td>
<td>13.16%</td>
<td>2.33%</td>
<td>4.00%</td>
<td>15.74%</td>
<td>7.79%</td>
<td>14.51%</td>
<td>13.69%</td>
</tr>
</tbody>
</table>

7-year total return (ordered from highest to lowest)

<table>
<thead>
<tr>
<th></th>
<th>FI</th>
<th>LSE</th>
<th>V</th>
<th>CTA</th>
<th>EM</th>
<th>Multi-strategy</th>
<th>UAIG</th>
<th>M</th>
<th>ED</th>
<th>EMN</th>
<th>FoF</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 years</td>
<td>157.4%</td>
<td>14.91%</td>
<td>14.47%</td>
<td>13.09%</td>
<td>13.16%</td>
<td>10.51%</td>
<td>13.13%</td>
<td>7.79%</td>
<td>4.00%</td>
<td>-2.33%</td>
<td>-11.51%</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database

However, in the last three years, the long/short equity strategy achieved the highest return, followed by multi-strategy and CTA; while the only strategy that posted losses was the volatility strategy. In this regard, the total return of the strategies in the last three years ranged from a loss of a 5.3% of the volatility strategy to a gain of a 13.7% of the long/short equity strategy. In annualized terms, the returns ranged from a loss of a 1.8% of the volatility strategy to a gain of a 4.37% of the long/short equity strategy.

### Table 102: Comparative analysis of alternative UCITS strategies: Return (annualized)

<table>
<thead>
<tr>
<th></th>
<th>UAIG</th>
<th>V</th>
<th>FoF</th>
<th>EM</th>
<th>EMN</th>
<th>ED</th>
<th>M</th>
<th>LSE</th>
<th>CTA</th>
<th>Multi-strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>1.80%</td>
<td>-0.97%</td>
<td>0.30%</td>
<td>1.58%</td>
<td>0.10%</td>
<td>-1.78%</td>
<td>0.73%</td>
<td>2.39%</td>
<td>1.46%</td>
<td>11.75%</td>
</tr>
<tr>
<td>3 years</td>
<td>1.92%</td>
<td>-1.00%</td>
<td>0.99%</td>
<td>0.84%</td>
<td>0.50%</td>
<td>0.25%</td>
<td>0.24%</td>
<td>1.38%</td>
<td>4.37%</td>
<td>2.34%</td>
</tr>
<tr>
<td>7 years</td>
<td>1.12%</td>
<td>1.05%</td>
<td>-1.73%</td>
<td>1.78%</td>
<td>-0.34%</td>
<td>0.55%</td>
<td>2.11%</td>
<td>1.88%</td>
<td>2.00%</td>
<td>1.85%</td>
</tr>
</tbody>
</table>

7-year annualized return (ordered from highest to lowest)

<table>
<thead>
<tr>
<th></th>
<th>FI</th>
<th>LSE</th>
<th>V</th>
<th>CTA</th>
<th>EM</th>
<th>Multi-strategy</th>
<th>UAIG</th>
<th>M</th>
<th>ED</th>
<th>EMN</th>
<th>FoF</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 years</td>
<td>2.11%</td>
<td>2.00%</td>
<td>1.95%</td>
<td>1.95%</td>
<td>1.78%</td>
<td>1.44%</td>
<td>1.12%</td>
<td>1.68%</td>
<td>0.56%</td>
<td>-0.34%</td>
<td>-1.73%</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database

Finally, in the last year, the best strategy in terms of returns, with a big difference, has been CTA, followed by macro; while the only two strategies that posted losses during the period were event driven and volatility. In this case, the returns ranged from a loss of a 1.76% of the event driven strategy to a gain of a 12.75% of the CTA strategy.
On the other hand, it must be highlighted that all the strategies implemented by alternative UCITS funds achieved superior returns than those of the main benchmark of the American equity market, the S&P 500, during the international financial crisis that began in 2007. In addition, since early 2011, the S&P 500 index was able to beat the funds of funds strategy. However, the trend began to change since mid-2012, when the S&P 500 index began to achieve higher returns than those of certain strategies such as long/short equity, equity market neutral, as well as than those of the UCITS Global Index. Shortly afterwards and, since early 2013, the S&P 500 index started to outperform several strategies such as emerging markets, macro, event driven, multi-strategy, CTA and fixed income. Finally, the S&P 500 index was also able to outperform the volatility strategy since late 2013.

Also, it must be highlighted that, during 2014, the S&P 500 Index has achieved far superior returns to those of the different strategies analyzed, as can be seen in the following chart.

Chart 41: Performance of UCITS Alternative Indexes vs S&P 500

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database
Additionally, the following graph shows the total return achieved by each of the strategies for each of the periods analyzed.

Chart 42: Alternative UCITS funds' strategies total returns (1, 3 and 7 years)

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database

4.3.3.2 Volatility

The annualized volatilities of the different strategies analyzed are shown in the following table.

Table 103: Comparative analysis of alternative UCITS strategies: Volatility (annualized)

<table>
<thead>
<tr>
<th></th>
<th>UAIG</th>
<th>Y</th>
<th>FOF</th>
<th>EM</th>
<th>EMN</th>
<th>ID</th>
<th>FI</th>
<th>M</th>
<th>LSE</th>
<th>CTA</th>
<th>Multi-strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>1.90%</td>
<td>1.05%</td>
<td>2.77%</td>
<td>4.01%</td>
<td>1.48%</td>
<td>2.78%</td>
<td>0.83%</td>
<td>1.91%</td>
<td>3.00%</td>
<td>5.93%</td>
<td>2.11%</td>
</tr>
<tr>
<td>3 years</td>
<td>2.24%</td>
<td>1.51%</td>
<td>2.00%</td>
<td>5.11%</td>
<td>1.35%</td>
<td>2.45%</td>
<td>1.12%</td>
<td>2.54%</td>
<td>3.51%</td>
<td>5.99%</td>
<td>2.22%</td>
</tr>
<tr>
<td>7 years</td>
<td>3.43%</td>
<td>2.90%</td>
<td>3.49%</td>
<td>9.77%</td>
<td>1.89%</td>
<td>3.60%</td>
<td>2.87%</td>
<td>3.40%</td>
<td>5.06%</td>
<td>5.00%</td>
<td>2.72%</td>
</tr>
</tbody>
</table>

7-year annualized volatility (ordered from highest to lowest)

<table>
<thead>
<tr>
<th></th>
<th>EM</th>
<th>LSE</th>
<th>CTA</th>
<th>ED</th>
<th>FOF</th>
<th>UAIG</th>
<th>M</th>
<th>Y</th>
<th>FI</th>
<th>Multi-strategy</th>
<th>EMN</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 years</td>
<td>9.77%</td>
<td>5.06%</td>
<td>5.00%</td>
<td>3.60%</td>
<td>3.40%</td>
<td>3.40%</td>
<td>3.40%</td>
<td>2.90%</td>
<td>2.87%</td>
<td>2.72%</td>
<td>1.89%</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database
In the last seven years, the strategy with the highest annualized volatility has been emerging markets, followed by long/short equity and CTA; while the strategy with the lowest annualized volatility has been equity market neutral. In this case, the annualized volatilities have ranged from a 9.77% of the emerging markets strategy to a 1.89% of the equity market neutral strategy.

On the other hand, in the last three years, the strategy with the highest annualized volatility has been CTA, followed by emerging markets; while the strategies with the lowest annualized volatilities have been fixed income and equity market neutral. In this period, the volatilities have ranged from a 5.59% of the CTA strategy to a 1.13% of the fixed income strategy.

Finally, in the last year, the strategies with the highest annualized volatilities have been CTA and emerging markets; while the strategies with the lowest annualized volatilities have been fixed income and volatility In this case, the volatilities have ranged from a 5.93% of the CTA strategy to a 0.83% of the fixed income strategy.

In addition, the performance of each of the strategies in terms of risk-return is shown in the following graph. The further to the left and up, the better.
4.3.3.3 Risk-adjusted returns

The Sharpe ratios of the different strategies analyzed are shown in the following table.

<table>
<thead>
<tr>
<th></th>
<th>UAIG</th>
<th>V</th>
<th>FoF</th>
<th>EM</th>
<th>EMN</th>
<th>ED</th>
<th>FI</th>
<th>M</th>
<th>LSE</th>
<th>CTA</th>
<th>Multi-strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>0.54</td>
<td>-0.95</td>
<td>0.15</td>
<td>0.37</td>
<td>0.05</td>
<td>-0.64</td>
<td>0.85</td>
<td>1.18</td>
<td>0.45</td>
<td>2.15</td>
<td>1.64</td>
</tr>
<tr>
<td>3 years</td>
<td>0.85</td>
<td>-1.20</td>
<td>0.37</td>
<td>0.16</td>
<td>0.35</td>
<td>0.08</td>
<td>1.96</td>
<td>0.54</td>
<td>1.24</td>
<td>0.41</td>
<td>1.53</td>
</tr>
<tr>
<td>7 years</td>
<td>0.52</td>
<td>0.66</td>
<td>-0.50</td>
<td>0.18</td>
<td>-0.19</td>
<td>0.15</td>
<td>0.73</td>
<td>0.31</td>
<td>0.29</td>
<td>0.36</td>
<td>0.52</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database

In the last seven years, the most efficient strategy has been fixed income, followed by volatility, as they offered 0.73 and 0.66 percentage points of net returns for each percentage point of total risk taken; while the less efficient strategies have been funds of funds and equity market neutral, as they posted a net loss of 0.5 and of 0.19 percentage points for each percentage point of total risk assumed. In this case, the Sharpe ratios have ranged from a -0.5 of the funds of funds strategy to a 0.73 of the fixed income strategy.

On the other hand, in the last three years, the most efficient strategies have been fixed income and multi-strategy, as they offered 1.96 and 1.53 percentage points of net returns for each percentage point of total risk assumed; while the less efficient strategies have been volatility and event driven. In this case, the Sharpe ratios have ranged from a -1.2 of the volatility strategy to a 1.96 of the fixed income strategy.

Finally, in the last year, the most efficient strategies have been CTA and macro; while the less efficient strategies have been volatility and event driven, as they posted a net loss of 0.95 and of 0.64 percentage points for each percentage point of total risk assumed. In this case, the Sharpe ratios have ranged from a -0.95 of the volatility strategy to a 2.15 of the CTA strategy.

On the other hand, the Treynor ratios of the different strategies analyzed are shown in the following table.
In the last seven years, the most efficient strategies have been multi-strategy and fixed income, as they offered 7.51 and 0.48 percentage points of net returns for each percentage point of market risk taken; while the less efficient strategies have been equity market neutral and CTA, as they posted a net loss of 1.07 and of 0.49 percentage points for each percentage point of market risk taken. In this case, the Treynor ratios of the strategies have ranged from a -1.07 of the equity market neutral strategy to a 7.51 of the multi-strategy index.

On the other hand, in the last three years, the most efficient strategies have been fixed income and equity market neutral, since they have been the only strategies that have offered a positive net return of 9.86 and of 0.56 percentage points for each percentage point of market risk assumed; while the less efficient strategies have been multi-strategy and macro. In this case, the Treynor ratios have ranged from a -2.09 of the multi-strategy index to a 9.86 of the fixed income strategy.

Finally, in the last year, the most efficient strategies have been fixed income and event driven, since they have been the only strategies that have offered positive net returns for each percentage point of market risk assumed; while the less efficient strategies have been volatility and CTA. In this case, the Treynor ratios have ranged from a -6.19 of the volatility strategy to a 0.81 of the fixed income strategy.

The following chart shows the level of efficiency of each of the alternative UCITS funds' strategies according to their Sharpe and Treynor ratios. In this regard, it must be said that, the further to the right and up, the better.
4.3.3.4 Beta

The betas of the different strategies analyzed are shown in the following table.

**Table 106: Comparative analysis of alternative UCITS strategies: Beta**

<table>
<thead>
<tr>
<th>Year</th>
<th>UAIG</th>
<th>V</th>
<th>FoF</th>
<th>EM</th>
<th>EMN</th>
<th>ED</th>
<th>Fl</th>
<th>M</th>
<th>LSE</th>
<th>CTA</th>
<th>Multi-strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>-0.15</td>
<td>0.02</td>
<td>-0.14</td>
<td>-0.18</td>
<td>-0.01</td>
<td>-0.18</td>
<td>0.01</td>
<td>0.06</td>
<td>-0.20</td>
<td>-0.59</td>
<td>-0.17</td>
</tr>
<tr>
<td>3 years</td>
<td>-0.03</td>
<td>0.03</td>
<td>-0.04</td>
<td>-0.02</td>
<td>-0.01</td>
<td>-0.01</td>
<td>0.002</td>
<td>0.01</td>
<td>-0.07</td>
<td>-0.06</td>
<td>-0.02</td>
</tr>
<tr>
<td>7 years</td>
<td>0.042</td>
<td>-0.043</td>
<td>0.038</td>
<td>0.11</td>
<td>0.003</td>
<td>0.05</td>
<td>0.0430</td>
<td>0.0434</td>
<td>0.06</td>
<td>-0.037</td>
<td>0.002</td>
</tr>
</tbody>
</table>

7-year Beta (ordered from highest to lowest)

<table>
<thead>
<tr>
<th>Year</th>
<th>EM</th>
<th>LSE</th>
<th>ED</th>
<th>M</th>
<th>Fl</th>
<th>UAIG</th>
<th>FoF</th>
<th>EMN</th>
<th>Multi-strategy</th>
<th>CTA</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 years</td>
<td>0.11</td>
<td>0.06</td>
<td>0.05</td>
<td>0.0434</td>
<td>0.0430</td>
<td>0.0442</td>
<td>0.003</td>
<td>0.002</td>
<td>-0.037</td>
<td>-0.343</td>
<td></td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database
In general terms, it must be noted that, in the last seven years, none of the strategies has been highly correlated with market movements, since their betas have been close to zero. The closest to zero beta was achieved by the multi-strategy index, while the highest beta was achieved by the emerging markets strategy. In this case and, as can be seen in the following chart, the betas have ranged from a 0.11 of the emerging markets strategy to a -0.04 of the volatility and CTA strategies.

![Chart 45: Alternative UCITS funds' strategies betas Last 7 years](image)

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database

As in the previous case, in the last three years, the betas of the different strategies analyzed stood at a level close to zero. The closest to zero beta during this period was achieved by the fixed income strategy, while the highest beta was achieved by the long/short equity strategy. In this case, the betas have ranged from a -0.07 of the long/short equity strategy to a 0.03 of the volatility strategy.

In the last year, the strategy with the highest beta has been CTA, with a beta of -0.59, indicating that the strategy has moved in the opposite way to market movements, followed by long/short equity, with a beta of -0.2; while the strategy with the closest to zero beta has been volatility. In this period, the betas have ranged from a -0.59 of the CTA strategy to a 0.01 of the fixed income strategy.

### 4.3.3.5 Other important performance metrics

The following table shows the returns achieved by each of the strategies at their best months for each of the periods analyzed.
Table 107: Comparative analysis of alternative UCITS strategies: Best month

<table>
<thead>
<tr>
<th></th>
<th>UAIG</th>
<th>V</th>
<th>Fof</th>
<th>EM</th>
<th>EMN</th>
<th>ED</th>
<th>FI</th>
<th>M</th>
<th>LSE</th>
<th>CTA</th>
<th>Multi-strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>1.60%</td>
<td>0.49%</td>
<td>1.17%</td>
<td>1.89%</td>
<td>0.51%</td>
<td>1.01%</td>
<td>0.45%</td>
<td>1.11%</td>
<td>2.14%</td>
<td>4.07%</td>
<td>1.06%</td>
</tr>
<tr>
<td>3 years</td>
<td>1.56%</td>
<td>1.03%</td>
<td>1.31%</td>
<td>4.05%</td>
<td>0.71%</td>
<td>1.54%</td>
<td>0.96%</td>
<td>1.70%</td>
<td>2.18%</td>
<td>4.07%</td>
<td>1.54%</td>
</tr>
<tr>
<td>7 years</td>
<td>2.19%</td>
<td>2.89%</td>
<td>1.31%</td>
<td>8.48%</td>
<td>1.22%</td>
<td>2.17%</td>
<td>2.02%</td>
<td>2.42%</td>
<td>3.28%</td>
<td>4.07%</td>
<td>1.33%</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database

In the last seven years, the strategy with the best month was emerging markets, with a return of nearly an 8.5%, followed by CTA, with a return of almost a 4.1%. In this case, the returns achieved by the strategies at their best months ranged from an 8.48% of the emerging markets strategy to a 1.22% of the equity market neutral strategy.

On the other hand, in the last three years, the strategies with the best months have been CTA and emerging markets, with returns of a 4.07% and of a 4.05%. In this case, the returns achieved by the strategies at their best months ranged from a 4.07% of the CTA strategy to a 0.71% of the equity market neutral strategy.

Finally, in the last year, the strategy with the best month was CTA, with a return of a 4.07%, followed by long/short equity, with a return of a 2.14%. In this case, the returns achieved by the strategies at their best months ranged from a 4.07% of the CTA strategy to a 0.45% of the fixed income strategy. The following chart shows the returns achieved by the UCITS funds’ strategies at their best months in the last 1, 3 and 7 years.

![Chart 46: Alternative UCITS funds' strategies best months](image)

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database
The returns achieved by the different strategies at their worst months are shown in the following table.

### Table 108: Comparative analysis of alternative UCITS strategies: Worst month

<table>
<thead>
<tr>
<th></th>
<th>1 year</th>
<th>V</th>
<th>FoF</th>
<th>EM</th>
<th>EMN</th>
<th>ED</th>
<th>FL</th>
<th>M</th>
<th>LSE</th>
<th>CTA</th>
<th>Multi-strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>-4.39%</td>
<td>-0.59%</td>
<td>-1.25%</td>
<td>-2.05%</td>
<td>-0.39%</td>
<td>-1.94%</td>
<td>-0.38%</td>
<td>-0.57%</td>
<td>-0.88%</td>
<td>-2.30%</td>
<td>-1.12%</td>
</tr>
<tr>
<td>3 years</td>
<td>-3.37%</td>
<td>-1.41%</td>
<td>-1.85%</td>
<td>-3.61%</td>
<td>-0.89%</td>
<td>-1.94%</td>
<td>-0.68%</td>
<td>-2.15%</td>
<td>-2.40%</td>
<td>-2.85%</td>
<td>-3.44%</td>
</tr>
<tr>
<td>7 years</td>
<td>-1.97%</td>
<td>-1.70%</td>
<td>-5.16%</td>
<td>-10.43%</td>
<td>2.54%</td>
<td>-4.59%</td>
<td>-4.58%</td>
<td>-5.87%</td>
<td>-5.87%</td>
<td>-2.85%</td>
<td>-1.08%</td>
</tr>
<tr>
<td>7 years (ordered from highest to lowest)</td>
<td>EM</td>
<td>FoF</td>
<td>LSE</td>
<td>ED</td>
<td>FL</td>
<td>UAG</td>
<td>M</td>
<td>CTA</td>
<td>Multi-strategy</td>
<td>EMN</td>
<td>V</td>
</tr>
<tr>
<td>1 year</td>
<td>-10.43%</td>
<td>-5.16%</td>
<td>-5.07%</td>
<td>-4.59%</td>
<td>-4.58%</td>
<td>-3.97%</td>
<td>-3.87%</td>
<td>-2.85%</td>
<td>-2.60%</td>
<td>-2.54%</td>
<td>-1.79%</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database

In the last seven years, the strategy with the worst month was emerging markets, with a loss of more than a 10.4%, followed by funds of funds, with a loss of a 5.16%. In this case, the losses posted by the different strategies at their worst months ranged from a 10.43% of the emerging markets strategy to a 1.7% of the volatility strategy.

On the other hand, in the last three years, the strategy with the worst month was emerging markets, with a loss of nearly a 3.7%, followed by CTA, with a loss of a 2.85%. In this case, the losses posted by the strategies at their worst months ranged from a 3.68% of the emerging markets strategy to a 0.68% of the fixed income strategy.

Finally, in the last year, the strategy with the worst month was CTA, with a loss of a 2.3%, followed by emerging markets, with a loss of over a 2%. In this period, the losses posted by the strategies at their worst months ranged from a 2.3% of the CTA strategy to a 0.38% of the fixed income strategy. All this can be seen in the following chart.

### Chart 47: Alternative UCITS funds' strategies worst months

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database
The maximum drawdowns of the different strategies for the different periods analyzed, as well as their recovery times, are shown in the following tables.

<table>
<thead>
<tr>
<th>Table 109: Comparative analysis of alternative UCITS strategies: Maximum drawdown</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>1 year</td>
</tr>
<tr>
<td>3 years</td>
</tr>
<tr>
<td>7 years</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Aix Capital UCITS Alternative Database

<table>
<thead>
<tr>
<th>Table 110: Comparative analysis of alternative UCITS strategies: Recovery time (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>1 year</td>
</tr>
<tr>
<td>3 years</td>
</tr>
<tr>
<td>7 years</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Aix Capital UCITS Alternative Database

In the last seven years, the strategy with the largest maximum drawdown was emerging markets, with a 21.87% drop that was recovered in 8 months, followed by funds of funds, with a drop of almost a 17.6% that was not recovered over the whole period. In this period, the maximum drawdowns ranged from a 21.87% of the emerging markets strategy to a 0% of the volatility, multi-strategy and CTA strategies. In addition, the recovery times of the maximum drawdowns ranged from the 21 months of the event driven strategy to the non-recovery of the funds of funds and equity market neutral strategies.

On the other hand, in the last three years, the strategy with the largest maximum drawdown was CTA, with almost a 6.1% drop that was recovered in 11 months, followed by volatility, with a 5.75% drop that was never recovered during the period. In this case, the maximum drawdowns ranged from a 6.08% of the CTA strategy to a 0% of some strategies. In addition, the recovery times ranged from the 15 months of the equity market neutral strategy to the non-recovery of certain strategies.
Finally, in the last year, the strategy with the largest maximum drawdown was event driven, with a drop of more than a 2.7% that was never recovered, followed by CTA, with a 2.3% drop that was recovered in 4 months. In this case, the maximum drawdowns ranged from a 2.71% of the event driven strategy to a 0% of the fixed income strategy. In addition, the recovery times ranged from the 5 months of the emerging markets strategy to the non-recovery of the volatility and event driven strategies. The following chart shows the maximum drawdowns of the alternative UCITS funds’ strategies in the last 1, 3 and 7 years.

![Chart 48: Alternative UCITS funds' strategies maximum drawdowns](image)

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database

### 4.3.3.6 Correlation

The following table shows the correlations between the different strategies analyzed in the last seven years.

<table>
<thead>
<tr>
<th>Table 111: Comparative analysis of alternative UCITS strategies: Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>V</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>V</td>
</tr>
<tr>
<td>FoF</td>
</tr>
<tr>
<td>EM</td>
</tr>
<tr>
<td>EMN</td>
</tr>
<tr>
<td>ED</td>
</tr>
<tr>
<td>FI</td>
</tr>
<tr>
<td>M</td>
</tr>
<tr>
<td>L/SE</td>
</tr>
<tr>
<td>CTA</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database
As shown in the table, the volatility strategy has had a negative correlation with all the strategies, except with the CTA strategy. In this regard, the highest negative correlations have been with the long/short equity and emerging markets strategies.

The funds of funds strategy has had a high positive correlation with the long/short equity, macro, fixed income and event driven strategies, as well as a negative correlation with the volatility strategy.

The emerging markets strategy has had a high positive correlation with the long/short equity, macro, fixed income and even driven strategies; a negative correlation with the volatility strategy; as well as no correlation with the CTA strategy.

Moreover, the equity market neutral strategy has had, in general terms, a low correlation with the other strategies. However, its higher positive correlation was with the long/short equity strategy. In addition, the strategy has had a negative correlation with the volatility strategy.

The event driven strategy has had a high positive correlation with the long/short equity, macro, funds of funds, emerging markets and fixed income strategies; a negative correlation with the volatility strategy; as well as no correlation with the CTA strategy.

The fixed income strategy has had a significant positive correlation with the macro, emerging markets, long/short equity, funds of funds and event driven strategies; a negative correlation with the volatility strategy; as well as a very low correlation with the CTA strategy.

The macro strategy has had a high positive correlation with the long/short equity, funds of funds, emerging markets, fixed income and event driven strategies; as well as a negative correlation with the volatility strategy.

The long/short equity strategy has had a high positive correlation with the macro, emerging markets, funds of funds, event driven and fixed income strategies; a negative correlation with the volatility strategy; as well as a very low correlation with the CTA strategy.

On the other hand, the CTA strategy has had, in general terms, a low correlation with the other strategies. However, its higher positive correlation was with the multi-strategy index, while its lower correlation was with the emerging markets strategy. In addition, it
has been the only strategy with a positive correlation, although low, with the volatility strategy.

Finally, the multi-strategy index has had, in general terms, a low correlation with the other strategies. However, its highest positive correlations have been with the funds of funds and macro strategies. In addition, it has had a negative correlation with the volatility strategy.
4.4 COMPARATIVE ANALYSIS BETWEEN THE PERFORMANCE OF UCITS AND HEDGE FUNDS

After having analyzed the performance of the different strategies implemented by UCITS funds and by hedge funds, it is time to carry out a comparative analysis between the equivalent strategies of both investment vehicles. After this comparative analysis, the different strategies analyzed will be ranked according to the efficiency achieved in the last 7 years. For this purpose, the Sharpe and Treynor ratios of each of the strategies will be used.

4.4.1 Comparative analysis of the equivalent strategies

In this section, a comparative analysis between the performance of the equivalent and comparable strategies implemented by hedge funds and by UCITS funds will be carried out. In this regard, there are some considerations that must be taken into account, which are described below:

- First of all, it must be noted that, due to the restrictions contained in the actual legislation, UCITS funds may not carry out short sales, so the dedicated short bias strategy implemented by hedge funds has not a UCITS equivalent.

- In addition, the database used to carry out the analysis of hedge funds does not include any funds of funds index, so the funds of funds strategy implemented by UCITS has not an equivalent hedge fund strategy in this study.

- Finally, the convertible arbitrage strategy included in the hedge funds database used to carry out the analysis has not a UCITS equivalent, since the volatility strategy included in the UCITS database seeks to profit from changes in the price of volatility by using different instruments that do not have to be exclusively convertible bonds.

Therefore, the strategies that will be compared are the following ones:

Figure 43: Equivalent/comparable strategies analyzed

![Image of a diagram showing the comparison of strategies between Hedge funds and Alternative UCITS]

Source: Compiled by author
4.4.1.1 Credit Suisse Hedge Fund Index vs UCITS Alternative Index Global

The main performance metrics of both indexes for the period analyzed are included in the following table.

**Table 112: Credit Suisse Hedge Fund Index vs UCITS Alternative Index Global**

(Main performance metrics)

<table>
<thead>
<tr>
<th>Credit Suisse Hedge Fund Index</th>
<th>UCITS Alternative Index Global</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return (total)</td>
<td>Return (annualized)</td>
</tr>
<tr>
<td>1 year</td>
<td>18.0%</td>
</tr>
<tr>
<td>3 years</td>
<td>18.0%</td>
</tr>
<tr>
<td>7 years</td>
<td>10.8%</td>
</tr>
<tr>
<td>Volatility (monthly)</td>
<td>Volatility (annualized)</td>
</tr>
<tr>
<td>1 year</td>
<td>0.55%</td>
</tr>
<tr>
<td>3 years</td>
<td>0.38%</td>
</tr>
<tr>
<td>7 years</td>
<td>0.26%</td>
</tr>
<tr>
<td>Sharpe ratio</td>
<td>Treynor ratio</td>
</tr>
<tr>
<td>1 year</td>
<td>0.94</td>
</tr>
<tr>
<td>3 years</td>
<td>-0.74</td>
</tr>
<tr>
<td>7 years</td>
<td>0.04</td>
</tr>
<tr>
<td>Beta</td>
<td></td>
</tr>
</tbody>
</table>

The total return achieved by the CS Hedge Fund Index has been higher than that achieved by the UAI Global in the last 1, 3 and 7 years. In this regard, the difference between the return achieved by hedge funds and that achieved by alternative UCITS funds was of almost a 21.5% in the last seven years; of more than a 14.3% in the last three years; and of more than a 2.6% in the last year. In annualized terms, the difference between the return achieved by the hedge fund index and that achieved by the alternative UCITS funds index was of a 2.65% in the last seven years; and of more than a 4.4% in the last three years.

**Chart 49: CS Hedge Fund Index vs UAI Global Total Return**

Source: Compiled by author based on data from the Alix Capital UCITS Alternative and Credit Suisse Hedge Fund databases
In addition, the UAI Global performed better than the CS HFI during the international financial crisis that began in late 2007, although the trend reverted in late 2010, as can be seen in the following graph.

On the other hand, the annualized volatility of the alternative UCITS index has been lower than that of the hedge fund index by almost a 2.9% in the last seven years; by a 1.1% in the last three years; and by around a 1% in the last year. The performance of both indexes in terms of risk-return in the last 7 years is shown in the following chart. In this regard, it must be noted that, the further to the left and up, the better.
In terms of risk-adjusted return, the hedge fund index has been more efficient than the alternative UCITS index in the last 7 years, as indicated by its higher Sharpe and Treynor ratios. In this regard, hedge funds offered 0.28 percentage points more of net returns for each percentage point of total risk assumed than alternative UCITS funds. In addition, the hedge fund index also offered 0.21 percentage points more of net returns for each percentage point of market risk assumed than alternative UCITS funds. The Sharpe and Treynor ratios of both strategies are represented in the following chart. In this regard, it must be said that, the further to the right and up, the better.

![Chart 52: Sharpe and Treynor ratio CS Hedge Fund Index vs UAI Global Last 7 years](image)

Source: Compiled by author based on data from the Alix Capital UCITS Alternative and Credit Suisse Hedge Fund databases

Also and, as can be seen in the following chart, it must be said that the betas of both indexes in the last seven years stood at a level close to zero, indicating that both indexes had a low correlation with market movements.

![Chart 53: CS Hedge Fund Index vs UAI Global Betas](image)

Source: Compiled by author based on data from the Alix Capital UCITS Alternative and Credit Suisse Hedge Fund databases

The following table lists other important metrics used to measure the performance of both indexes over the period analyzed.
In the last 1, 3 and 7 years, the hedge fund index achieved a higher return at its best months than the alternative UCITS index. In this regard, the difference between the return achieved by both indexes at their best months has been of almost a 1.9% in the last seven years; of almost a 1% in the last three years; and of a 0.66% in the last year. On the other hand, the hedge fund index posted higher losses at its worst months in the last 1, 3 and 7 years than the alternative UCITS funds index. In this case, the difference between the losses posted by both indexes at their worst months was of almost a 2.6% in the last seven years; of nearly a 0.3% in the last three years; and of more than a 0.4% in the last year. In addition, the hedge fund index had a maximum drawdown of almost a 10.9% higher than that of the alternative UCITS funds index in the last seven years. This maximum drawdown of hedge funds took to recover 6 months more than that of the alternative UCITS funds. All these aspects are shown in the following graphs.
Finally, it must be noted that the correlation between both indexes has been positive and very high in the last seven years, as shown in the following table.

**Table 114: Credit Suisse Hedge Fund Index vs UCITS Alternative Index Global (Correlation)**

<table>
<thead>
<tr>
<th>Credit Suisse Hedge Fund Index</th>
<th>UCITS Alternative Index Global</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.88</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative and Credit Suisse Hedge Fund databases

**4.4.1.2 Credit Suisse Emerging Markets Hedge Fund Index vs UCITS Alternative Index Emerging Markets**

The following table summarizes the main results obtained after having analyzed the Credit Suisse Emerging Markets Hedge Fund Index and the UCITS Alternative Index Emerging Markets.
The total return achieved by the CS Emerging Markets Hedge Fund Index has been higher than that achieved by the UAI Emerging Markets in the last 1, 3 and 7 years. In this regard, the difference between the return achieved by hedge funds and that achieved by alternative UCITS funds was of more than a 4.5% in the last seven years; of almost a 15% in the last three years; as well as of almost a 2.4% in the last year. In annualized terms, the difference between the return achieved by the emerging markets hedge fund index and that achieved by the alternative UCITS emerging markets index was of almost a 0.6% in the last seven years; and of a 4.66% in the last three years.

In addition, the UAI Emerging Markets performed better than the CS Emerging Markets HFI during the international financial crisis that began in late 2007, although the trend reverted since mid-2013, as shown in the following graph.
The annualized volatility of the emerging markets hedge fund index has been higher than that of the alternative UCITS emerging markets index by a 0.5% in the last seven years; by more than a 0.4% in the last three years; and by a 0.46% in the last year. The following chart shows the performance of both indexes in terms of risk-return in the last 7 years.
In terms of risk-adjusted return, the emerging markets hedge fund index has been more efficient than the alternative UCITS emerging markets index in the last 7 years, as indicated by its higher Sharpe and Treynor ratios. In this regard, hedge funds offered 0.05 percentage points more of net returns for each percentage point of total risk assumed than alternative UCITS funds. In addition, the hedge fund index also offered 0.01 percentage points more of net returns for each percentage point of market risk assumed than alternative UCITS funds. The Sharpe and Treynor ratios of both strategies are shown in the following graph.

![Chart 60: Sharpe and Treynor ratio](chart60.png)

Source: Compiled by author based on data from the Alix Capital UCITS Alternative and Credit Suisse Hedge Fund databases

Also, the betas of both indexes in the last seven years stood at a level close to zero, as can be seen in the following chart.

![Chart 61: CS Emerging Markets HFI vs UAI Emerging Markets Betas](chart61.png)

Source: Compiled by author based on data from the Alix Capital UCITS Alternative and Credit Suisse Hedge Fund databases

The following table lists other important statistics of both indexes.
In the last 1, 3 and 7 years, the alternative UCITS emerging markets index achieved a higher return at its best months than the emerging markets hedge fund index. In this regard, the difference between the return achieved by both indexes at their best months has been of more than a 1.5% in the last seven years; of more than a 0.3% in the last three years; and of a 0.01% in the last year. On the other hand, the emerging markets hedge fund index posted higher losses at its worst months in the last 1, 3 and 7 years than the alternative UCITS emerging markets index. In this case, the difference between the losses posted by both indexes at their worst months was of a 3.2% in the last seven years; of more than a 0.1% in the last three years; as well as of more than a 0.2% in the last year. In addition, the emerging markets hedge fund index had a maximum drawdown of almost a 10.1% higher than that of the alternative UCITS emerging markets index in the last seven years. This maximum drawdown of hedge funds took to recover 14 months more than that of the alternative UCITS funds. All these aspects are shown in the following graphs.

![Chart 62: CS Emerging Markets HFI vs UAI Emerging Markets Best months](chart.png)

Source: Compiled by author based on data from the Alix Capital UCITS Alternative and Credit Suisse Hedge Fund databases
Finally, it must be highlighted that both indexes had a very high positive correlation in the last seven years, as shown in the following table.

Table 117: Credit Suisse Emerging Markets Hedge Fund Index vs UAI Emerging Markets (Correlation)

<table>
<thead>
<tr>
<th>Credit Suisse Emerging Markets Hedge Fund Index</th>
<th>UCITS Alternative Index Emerging Markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.89</td>
<td></td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative and Credit Suisse Hedge Fund databases

4.4.1.3 Credit Suisse Equity Market Neutral Hedge Fund Index vs UCITS Alternative Index Equity market Neutral

The main metrics calculated for the period analyzed of both indexes are shown in the following table.
The total return achieved by the CS Equity Market Neutral Hedge Fund Index has been lower than that achieved by the UAI Equity Market Neutral in the last 1 and 7 years, although higher in the last 3 years. In this regard, the equity market neutral hedge fund index posted a loss of a 28.1% higher than the alternative UCITS equity market neutral index in the last 7 years; a gain of almost a 7.2% higher in the last 3 years; as well as a return of a 1.37% lower in the last year. In annualized terms, the difference between the return achieved by the equity market neutral HFI and that achieved by the alternative UCITS equity market neutral index was of more than a -4.7% in the last seven years; as well as of more than a 2.3% in the last three years.
In this case, the alternative UCITS equity market neutral index performed better than the equity market neutral hedge fund index over the whole period analyzed, as can be seen in the following chart.

The annualized volatility of the equity market neutral hedge fund index has been higher than that of the alternative UCITS equity market neutral index by a 14.3% in the last seven years; by a 2.43% in the last three years; and by a 0.31% in the last year. The performance of both indexes in the last 7 years is shown in the following graph.
In terms of risk-adjusted return, the equity market neutral hedge fund index posted 0.12 percentage points more of net losses for each percentage point of total risk assumed than the alternative UCITS equity market neutral index. However, the equity market neutral hedge fund index offered 2.61 percentage points more of net returns for each percentage point of market risk assumed than the alternative UCITS equity market neutral index. In this regard, the EMN HFI has been more efficient than the UAI EMN according to the Treynor ratio, although less efficient according to the Sharpe ratio. The Sharpe and Treynor ratios of the two strategies are shown in the following chart.

In addition, the betas of both indexes in the last seven years stood at a level close to zero, as can be seen in the following chart.

The following table lists other important metrics used to measure the performance of both indexes.
In the last 1, 3 and 7 years, the equity market neutral hedge fund index achieved a higher return at its best months than the alternative UCITS equity market neutral index. In this regard, the difference between the return achieved by both indexes at their best months has been of a 2.44% in the last seven years; of a 1.88% in the last three years; and of a 0.19% in the last year. On the other hand, the equity market neutral hedge fund index posted higher losses than the alternative UCITS EMN index at its worst months in the last 3 and 7 years, although lower in the last year. In this case, the difference between the losses posted by both indexes at their worst months was of more than a 37.9% in the last seven years; of nearly a 2.3% in the last three years; and of a -0.19% in the last year. In addition, the EMN hedge fund index had a maximum drawdown of almost a 37.6% higher than that of the alternative UCITS EMN index in the last seven years. In both cases, none of the maximum drawdowns was recovered during the period. The following graphs show all these aspects.
Finally, it must be said that the correlation between both indexes has been very low in the last seven years, as shown in the following table.

**Table 120: Credit Suisse Equity Market Neutral Hedge Fund Index vs UAI Equity Market Neutral (Correlation)**

<table>
<thead>
<tr>
<th>Credit Suisse Equity Market Neutral Hedge Fund Index</th>
<th>0.18</th>
</tr>
</thead>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative and Credit Suisse Hedge Fund databases

**4.4.1.4 Credit Suisse Event Driven Hedge Fund Index vs UCITS Alternative Index Event Driven**

The main statistics of both indexes for the period analyzed are included in the following table.
The total return achieved by the CS Event Driven Hedge Fund Index has been higher than that achieved by the UAI Event Driven in the last 1, 3 and 7 years. In this regard, the difference between the return achieved by hedge funds and that achieved by alternative UCITS funds was of more than a 30.8% in the last seven years; of more than a 25.4% in the last three years; as well as of more than a 3% in the last year. In annualized terms, the difference between the return achieved by the event driven hedge fund index and that achieved by the alternative UCITS event driven index was of a 3.8% in the last seven years; and of more than a 7.8% in the last three years.

Source: Compiled by author based on data from the Alix Capital UCITS Alternative and Credit Suisse Hedge Fund databases
In addition, the UAI Event Driven performed better than the CS Event Driven HFI during 2009, although the trend reverted since early 2010, as shown in the following graph.

![Chart 74: CS Event Driven HFI vs UAI Event Driven](image)

Source: Compiled by author based on data from the Alix Capital UCITS Alternative and Credit Suisse Hedge Fund databases

The annualized volatility of the event driven hedge fund index has been higher than that of the alternative UCITS event driven index by almost 3.3% in the last seven years; by 1.25% in the last three years; and by 1.75% in the last year. The performance of both indexes in terms of risk-return in the last 7 years is shown in the following chart.
In terms of risk-adjusted return, the event driven hedge fund index has been more efficient than the alternative UCITS event driven index in the last 7 years, as indicated by its higher Sharpe and Treynor ratios. In this regard, the event driven hedge fund index offered 0.47 percentage points more of net returns for each percentage point of total risk assumed than the alternative UCITS event driven index; as well as 0.5 percentage points more of net returns for each percentage point of market risk assumed. The following chart shows the Sharpe and Treynor ratios of both strategies.

![Chart 76: Sharpe and Treynor ratio](chart.png)

In addition, the betas of both indexes in the last seven years stood at a level close to zero, as can be seen in the following chart.

![Chart 77: CS Event Driven HFI vs UAI Even Driven Betas](chart.png)

The following table lists other important statistics used to measure the performance of both indexes.
In the last 1, 3 and 7 years, the event driven hedge fund index achieved a higher return at its best months than the alternative UCITS event driven index. In this regard, the difference between the return achieved by both indexes at their best months has been of more than a 2% in the last seven years; of a 1.26% in the last three years; and of almost a 1.75% in the last year. On the other hand, the event driven hedge fund index posted higher losses at its worst months in the last 1, 3 and 7 years than the alternative UCITS event driven index. In this case, the difference between the losses posted by both indexes at their worst months was of a 1.16% in the last seven years; of more than a 0.2% in the last three years; as well as of a 0.22% in the last year. In addition, the event driven hedge fund index had a maximum drawdown of almost a 9.7% higher than that of the alternative UCITS event driven index in the last seven years. This maximum drawdown of hedge funds took to recover 10 months less than that of the alternative UCITS funds. All these aspects are shown in the following graphs.

Source: Compiled by author based on data from the Alix Capital UCITS Alternative and Credit Suisse Hedge Fund databases

Table 122: Credit Suisse Event Driven Hedge Fund Index vs UAI Event Driven
(Other performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>Best month</th>
<th>Worst month</th>
<th>Maximum drawdown</th>
<th>Recovery time (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Credit Suisse Event Driven Hedge Fund Index</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 year</td>
<td>2.75%</td>
<td>-2.16%</td>
<td>0.00%</td>
<td>N/A</td>
</tr>
<tr>
<td>3 years</td>
<td>2.80%</td>
<td>-2.16%</td>
<td>0.00%</td>
<td>N/A</td>
</tr>
<tr>
<td>7 years</td>
<td>4.22%</td>
<td>-5.75%</td>
<td>-18.03%</td>
<td>11</td>
</tr>
<tr>
<td><strong>UAI Event Driven</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 year</td>
<td>1.01%</td>
<td>-1.94%</td>
<td>-2.71%</td>
<td>N/A</td>
</tr>
<tr>
<td>3 years</td>
<td>1.54%</td>
<td>-1.94%</td>
<td>-2.01%</td>
<td>5</td>
</tr>
<tr>
<td>7 years</td>
<td>2.17%</td>
<td>-4.59%</td>
<td>-8.36%</td>
<td>21</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative and Credit Suisse Hedge Fund databases
Finally, it must be highlighted that both indexes had a high positive correlation in the last seven years, as shown in the following table.

<table>
<thead>
<tr>
<th>Table 123: Credit Suisse Event Driven Hedge Fund Index vs UCITS Alternative Index Event Driven (Correlation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credit Suisse Event Driven Hedge Fund Index</td>
</tr>
<tr>
<td>UCITS Alternative Index Event Driven</td>
</tr>
<tr>
<td>0.73</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative and Credit Suisse Hedge Fund databases

4.4.1.5 Credit Suisse Fixed Income Arbitrage Hedge Fund Index vs UCITS Alternative Index Fixed Income

The following table summarizes the main results obtained after having analyzed the Credit Suisse Fixed Income Arbitrage Hedge Fund Index and the UCITS Alternative Index Fixed Income.
The total return achieved by the CS Fixed Income Arbitrage Hedge Fund Index has been higher than that achieved by the UAI Fixed Income in the last 1, 3 and 7 years. In this regard, the difference between the return achieved by hedge funds and that achieved by alternative UCITS funds was of a 12.4% in the last seven years; of more than a 12% in the last three years; as well as of more than a 2.6% in the last year. In annualized terms, the difference between the return achieved by the FIA hedge fund index and that achieved by the alternative UCITS FI index was of a 1.5% in the last seven years; and of a 3.7% in the last three years.

Also and, as can be seen in the following graph, the UAI Fixed Income performed better than the CS Fixed Income Arbitrage HFI during the international financial crisis that began in late 2007, although the trend reverted since early 2012.
The annualized volatility of the FIA hedge fund index has been higher than that of the alternative UCITS FI index by more than a 4.9% in the last seven years; by more than a 0.5% in the last three years; and by a 0.2% in the last year. The performance of both indexes in the last 7 years is shown in the following graph.

In terms of risk-adjusted return, the alternative UCITS fixed income index has been more efficient than the fixed income arbitrage hedge fund index in the last 7 years, as
indicated by its higher Sharpe and Treynor ratios. In this regard, the alternative UCITS fixed income index offered 0.27 percentage points more of net returns for each percentage point of total risk assumed than the fixed income arbitrage hedge fund index; as well as 0.24 percentage points more of net returns for each percentage point of market risk assumed. The Sharpe and Treynor ratios of the two strategies are shown in the following chart.

In addition, the betas of both indexes in the last seven years stood at a level close to zero. This can be seen in the following chart.

The following table lists other important statistics of both indexes.
In the last 1, 3 and 7 years, the FIA hedge fund index achieved a higher return at its best months than the alternative UCITS FI index. In this regard, the difference between the return achieved by both indexes at their best months has been of more than a 2.3% in the last seven years; of a 0.66% in the last three years; and of a 0.55% in the last year. On the other hand, the FIA hedge fund index posted higher losses than the alternative UCITS FI index at its worst months in the last 3 and 7 years, although lower in the last year. In this case, the difference between the losses posted by both indexes at their worst months was of a 9.46% in the last seven years; of a 0.46% in the last three years; as well as of a -0.28% in the last year. In addition, the fixed income arbitrage hedge fund index had a maximum drawdown of almost a 21.2% higher than that of the alternative UCITS fixed income index in the last seven years. This maximum drawdown of hedge funds took to recover 17 months more than that of the alternative UCITS funds. The following graphs show all these aspects.
Finally, it must be said that both indexes had a high positive correlation in the last seven years, as can be seen in the following table.

<table>
<thead>
<tr>
<th>Credit Suisse Fixed Income Arbitrage Hedge Fund Index vs UAI Fixed Income (Correlation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credit Suisse Fixed Income Arbitrage Hedge Fund Index</td>
</tr>
<tr>
<td>0.87</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative and Credit Suisse Hedge Fund databases

4.4.1.6 Credit Suisse Global Macro Hedge Fund Index vs UCITS Alternative Index Macro

The main performance metrics of both indexes for the period analyzed are included in the following table.
The total return achieved by the CS Global Macro Hedge Fund Index has been higher than that achieved by the UAI Macro in the last 1, 3 and 7 years. In this regard, the difference between the return achieved by the global macro hedge fund index and that achieved by the alternative UCITS macro index was of more than a 30.6% in the last seven years; of more than a 6.9% in the last three years; as well as of more than a 1.9% in the last year. In annualized terms, the difference between the return achieved by the global macro hedge fund index and that achieved by the alternative UCITS macro index was of almost a 3.7% in the last seven years; as well as of a 2.2% in the last three years.

In addition, the global macro hedge fund index performed better than the alternative UCITS macro index during the whole period analyzed, as can be seen in the following chart.

Source: Compiled by author based on data from the Alix Capital UCITS Alternative and Credit Suisse Hedge Fund databases
The annualized volatility of the global macro hedge fund index has been higher than that of the alternative UCITS macro index by almost a 2.4% in the last seven years; by a 0.75% in the last three years; and by more than a 0.9% in the last year. The performance of both indexes in the last 7 years is shown in the following graph.

In terms of risk-adjusted return, the global macro hedge fund index has been more efficient than the alternative UCITS macro index in the last 7 years, as indicated by its higher Sharpe and Treynor ratios. In this regard, the global macro hedge fund index
offered 0.51 percentage points more of net returns for each percentage point of total risk assumed than the alternative UCITS macro index; as well as 0.91 percentage points more of net returns for each percentage point of market risk assumed. The following chart shows the Sharpe and Treynor ratios of both strategies.

In addition and, as happened with the other strategies analyzed, the betas of both indexes in the last seven years stood at a level close to zero, as can be seen in the following chart.

The following table shows other important metrics used to measure the performance of both indexes.
In the last 1, 3 and 7 years, the global macro hedge fund index achieved a higher return at its best months than the alternative UCITS macro index. In this regard, the difference between the return achieved by both indexes at their best months has been of more than a 2% in the last seven years; of a 0.44% in the last three years; and of a 0.54% in the last year. On the other hand, the global macro hedge fund index posted higher losses at its worst months in the last 1, 3 and 7 years than the alternative UCITS macro index. In this regard, the difference between the losses posted by both indexes at their worst months was of a 2.76% in the last seven years; of a 0.33% in the last three years; as well as of almost a 0.5% in the last year. In addition, the global macro hedge fund index had a maximum drawdown of a 1.23% lower than that of the alternative UCITS macro index in the last seven years. This maximum drawdown of hedge funds took to recover the same number of months than that of the alternative UCITS funds. The following graphs show all these aspects.

Source: Compiled by author based on data from the Alix Capital UCITS Alternative and Credit Suisse Hedge Fund databases
Finally, it must be highlighted that both indexes had a positive correlation, although not very strong, in the last seven years, as shown in the following table.

**Table 129: Credit Suisse Global Macro Hedge Fund Index vs UCITS Alternative Index Macro (Correlation)**

<table>
<thead>
<tr>
<th>Credit Suisse Global Macro Hedge Fund Index</th>
<th>UCITS Alternative Index Macro</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.52</td>
<td></td>
</tr>
</tbody>
</table>

**4.4.1.7 Credit Suisse Long/Short Equity Hedge Fund Index vs UCITS Alternative Index Long/Short Equity**

The main statistics of both indexes for the period analyzed are included in the following table.
The total return achieved by the CS Long/Short Equity Hedge Fund Index has been higher than that achieved by the UAI Long/Short Equity in the last 1, 3 and 7 years. In this regard, the difference between the return achieved by hedge funds and that achieved by alternative UCITS funds was of almost a 21.2% in the last seven years; of more than a 15.7% in the last three years; as well as of almost a 4.2% in the last year. In annualized terms, the difference between the return achieved by the long/short equity hedge fund index and that achieved by the alternative UCITS long/short equity index was of a 2.5% in the last seven years; and of a 4.6% in the last three years.

Source: Compiled by author based on data from the Alix Capital UCITS Alternative and Credit Suisse Hedge Fund databases

Table 130: Credit Suisse Long/Short Equity Hedge Fund Index vs UAI Long/Short Equity
(Main performance metrics)
In addition, the UAI Long/Short Equity performed better than the CS Long/Short Equity HFI during the international financial crisis, although the trend reverted since late 2010, as shown in the following graph.

![Chart 98: CS Long/Short Equity HFI vs UAI Long/Short Equity](image)

Source: Compiled by author based on data from the Alix Capital UCITS Alternative and Credit Suisse Hedge Fund databases

The annualized volatility of the long/short equity hedge fund index has been higher than that of the alternative UCITS long/short equity index by a 3.52% in the last seven years; by a 2.03% in the last three years; and by a 1.42% in the last year. The performance of both indexes in terms of risk-return in the last 7 years is shown in the following chart.

![Chart 99: CS Long/Short Equity vs UAI Long/Short Equity 7-years performance](image)

Source: Compiled by author based on data from the Alix Capital UCITS Alternative and Credit Suisse Hedge Fund databases
In terms of risk-adjusted return, the long/short equity hedge fund index has been more efficient than the alternative UCITS long/short equity index in the last 7 years, as indicated by its higher Sharpe and Treynor ratios. In this regard, the long/short equity hedge fund index offered 0.13 percentage points more of net returns for each percentage point of total risk assumed than the alternative UCITS long/short equity index; as well as 0.11 percentage points more of net returns for each percentage point of market risk assumed. The Sharpe and Treynor ratios of both strategies are shown in the following chart.

In addition, the betas of both indexes in the last seven years stood at a level close to zero, as can be seen in the following chart.

The following table lists other important statistics of both indexes.
In the last 1, 3 and 7 years, the long/short equity hedge fund index achieved a higher return at its best months than the alternative UCITS long/short equity index. In this regard, the difference between the return achieved by both indexes at their best months has been of a 1.95% in the last seven years; of a 1.7% in the last three years; and of a 0.74% in the last year. On the other hand, the long/short equity hedge fund index posted higher losses at its worst months in the last 1, 3 and 7 years than the alternative UCITS long/short equity index. In this regard, the difference between the losses posted by both indexes at their worst months was of a 2.74% in the last seven years; of a 2.13% in the last three years; as well as of a 0.21% in the last year. In addition, the long/short equity hedge fund index had a maximum drawdown of an 8.12% higher than that of the alternative UCITS long/short equity index in the last seven years. This maximum drawdown of hedge funds took to recover 7 months more than that of the alternative UCITS funds. All these aspects are shown in the following graphs.

Source: Compiled by author based on data from the Alix Capital UCITS Alternative and Credit Suisse Hedge Fund databases
Finally, it must be noted that both indexes had a very high positive correlation in the last seven years, as shown in the following table.

<table>
<thead>
<tr>
<th></th>
<th>Credit Suisse Long/Short Equity Hedge Fund Index</th>
<th>UCITS Alternative Index Long/Short Equity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>-10.00%</td>
<td>-10.00%</td>
</tr>
<tr>
<td>3 years</td>
<td>-8.00%</td>
<td>-8.00%</td>
</tr>
<tr>
<td>7 years</td>
<td>-6.00%</td>
<td>-6.00%</td>
</tr>
</tbody>
</table>

4.4.1.8 Credit Suisse Managed Futures Hedge Fund Index vs UCITS Alternative Index CTA

The following table summarizes the main results obtained after having analyzed the Credit Suisse Managed Futures Hedge Fund Index and the UCITS Alternative Index CTA.
The total return achieved by the CS Managed Futures Hedge Fund Index has been higher than that achieved by the UAI CTA in the last 1, 3 and 7 years. In this regard, the difference between the return achieved by the managed futures hedge fund index and that achieved by the alternative UCITS CTA index was of more than a 14.1% in the last seven years; of more than a 3.5% in the last three years; as well as of more than a 9.8% in the last year. In annualized terms, the difference between the return achieved by the managed futures hedge fund index and that achieved by the alternative UCITS CTA index was of more than a 1.7% in the last seven years; and of a 1.1% in the last three years.
In addition, the managed futures hedge fund index performed better in general terms, with the exception of the second half of 2009 and the first half of 2010, than the alternative UCITS CTA index during the whole period analyzed, as can be seen in the following chart.

![Chart 106: CS Managed Futures HFI vs UAI CTA](chart106)

The annualized volatility of the managed futures hedge fund index has been higher than that of the alternative UCITS CTA index by a 5.73% in the last seven years; by a 4.44% in the last three years; and by a 4.21% in the last year. The performance of both indexes in the last 7 years is shown in the following graph.

![Chart 107: CS Managed Futures vs UAI CTA 7-years performance](chart107)
In terms of risk-adjusted return, the alternative UCITS CTA index has been more efficient than the managed futures hedge fund index in the last 7 years, as indicated by its higher Sharpe and Treynor ratios. In this regard, alternative UCITS CTA index offered 0.03 percentage points more of net returns for each percentage point of total risk assumed than the managed futures hedge fund index; as well as 0.26 percentage points less of net losses for each percentage point of market risk assumed. The following graph shows the Sharpe and Treynor ratios of both strategies.

In addition and, as happened with the other strategies analyzed, the betas of both indexes in the last seven years stood at a level close to zero, as can be seen in the following chart.

The following table shows other important metrics used to measure the performance of both indexes.
In the last 1, 3 and 7 years, the managed futures hedge fund index achieved a higher return at its best months than the alternative UCITS CTA index. In this regard, the difference between the return achieved by both indexes at their best months has been of a 3.43% in the last 1, 3 and 7 years. On the other hand, the managed futures hedge fund index posted higher losses at its worst months in the last 1, 3 and 7 years than the alternative UCITS CTA index. In this regard, the difference between the losses posted by both indexes at their worst months was of a 2.57% in the last 3 and 7 years; as well as of a 1.12% in the last year. In addition, none of the indexes had a maximum drawdown in the last 7 years, although if the period analyzed is restricted to the last 3 years, the managed futures hedge fund index had a maximum drawdown of a 4.02% higher than the alternative UCITS CTA index. This maximum drawdown of hedge funds took to recover 1 month more than that of the alternative UCITS funds. All these aspects are shown in the following graphs.

![Chart 110: CS Managed Futures HFI vs UAI CTA](source)

Source: Compiled by author based on data from the Alis Capital UCITS Alternative and Credit Suisse Hedge Fund databases
Finally, it must be noted that both indexes had a very high positive correlation in the last seven years, as shown in the following table.

### Table 135: Credit Suisse Managed Futures Hedge Fund Index vs UCITS Alternative Index CTA

<table>
<thead>
<tr>
<th>Credit Suisse Managed Futures Hedge Fund Index</th>
<th>UCITS Alternative Index CTA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.89</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative and Credit Suisse Hedge Fund databases

**4.4.1.9 Credit Suisse Multi-Strategy Hedge Fund Index vs UCITS Alternative Index Multi-Strategy**

The main performance metrics of the last two indexes analyzed are listed in the following table.
The total return achieved by the CS Multi-Strategy Hedge Fund Index has been higher than that achieved by the UAI Multi-Strategy in the last 1, 3 and 7 years. In this regard, the difference between the return achieved by the multi-strategy hedge fund index and that achieved by the alternative UCITS multi-strategy index was of more than a 31% in the last seven years; of more than a 17.4% in the last three years; as well as of more than a 3% in the last year. In annualized terms, the difference between the return achieved by the multi-strategy hedge fund index and that achieved by the alternative UCITS multi-strategy index was of a 3.65% in the last seven years; as well as of a 5.17% in the last three years.
In addition, the UAI Multi-Strategy performed better than the CS Multi-Strategy HFI during the international financial crisis, although the trend reverted since late 2010, as shown in the following graph.

The annualized volatility of the multi-strategy hedge fund index has been higher than that of the alternative UCITS multi-strategy index by a 3.64% in the last seven years; by a 0.5% in the last three years; and by a 0.11% in the last year. The performance of both indexes in the last 7 years is shown in the following graph.
In terms of risk-adjusted return, the multi-strategy hedge fund index offered 0.28 percentage points more of net returns for each percentage point of total risk assumed than the alternative UCITS multi-strategy index. However, the alternative UCITS multi-strategy index offered 7.03 percentage points more of net returns for each percentage point of market risk assumed than the multi-strategy hedge fund index. In this regard, the CS Multi-Strategy HFI has been more efficient than the UAI Multi-Strategy according to the Sharpe ratio, although less efficient according to the Treynor ratio. The Sharpe and Treynor ratios of both strategies are shown in the following chart.

In addition, the betas of both indexes in the last seven years stood at a level close to zero, as can be seen in the following chart.
The following table lists other important statistics of both indexes.

### Table 137: Credit Suisse Multi-Strategy Hedge Fund Index vs UAI Multi-Strategy

<table>
<thead>
<tr>
<th></th>
<th>Credit Suisse Multi-Strategy Hedge Fund Index</th>
<th>UAI Multi-Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Best month</td>
<td>Worst month</td>
<td>Maximum drawdown</td>
</tr>
<tr>
<td>1 year</td>
<td>1.41%</td>
<td>-0.49%</td>
</tr>
<tr>
<td>3 years</td>
<td>2.47%</td>
<td>-1.17%</td>
</tr>
<tr>
<td>7 years</td>
<td>4.28%</td>
<td>-7.35%</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Aix Capital UCITS Alternative and Credit Suisse Hedge Fund databases.

In the last 1, 3 and 7 years, the multi-strategy hedge fund index achieved a higher return at its best months than the alternative UCITS multi-strategy index. In this regard, the difference between the return achieved by both indexes at their best months has been of a 1.95% in the last seven years; of a 0.93% in the last three years; and of a 0.35% in the last year. On the other hand, the multi-strategy hedge fund index posted higher losses at its worst months than the alternative UCITS multi-strategy index in the last 7 years, although lower in the last 1 and 3 years. In this regard, the difference between the losses posted by both indexes at their worst months was of a 4.75% in the last seven years; of a -0.17% in the last three years; as well as of a -0.63% in the last year. In addition, the multi-strategy hedge fund index had a maximum drawdown of a 23.64% in the last seven years, while the alternative UCITS multi-strategy index had no maximum drawdown. This maximum drawdown of hedge funds was recovered in 22 months.

All the statistics of both indexes analyzed above are shown in the following three graphs.
Chart 118: CS Multi-strategy HFI vs UAI Multi-strategy
Best months

Source: Compiled by author based on data from the Alix Capital UCITS Alternative and Credit Suisse Hedge Fund databases

Chart 119: CS Multi-strategy HFI vs UAI Multi-strategy
Worst months

Source: Compiled by author based on data from the Alix Capital UCITS Alternative and Credit Suisse Hedge Fund databases

Chart 120: CS Multi-strategy HFI vs UAI Multi-strategy
Maximum drawdowns

Source: Compiled by author based on data from the Alix Capital UCITS Alternative and Credit Suisse Hedge Fund databases
Finally, it must be highlighted that both indexes had a positive correlation, although not very strong, in the last seven years, as shown in the following table.

### Table 138: Credit Suisse Multi-Strategy Hedge Fund Index vs UAI Multi-Strategy
(Correlation)

<table>
<thead>
<tr>
<th>Credit Suisse Multi-Strategy Hedge Fund Index</th>
<th>UCITS Alternative Index Multi-Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.38</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative and Credit Suisse Hedge Fund databases

Additionally, the following table shows the correlation of the comparable/equivalent strategies ordered from highest to lowest.

### Table 139: Correlation of the comparable/equivalent strategies (ordered from highest to lowest)

| CS Long/Short Equity HFI & UAI Long/Short Equity | 0.91 |
| CS Emerging Markets HFI & UAI Emerging Markets | 0.889 |
| CS Managed Futures HFI & UAI CTA               | 0.885 |
| CS Hedge Fund Index & UAI Global              | 0.881 |
| CS Fixed Income Arbitrage HFI & UAI Fixed Income | 0.87 |
| CS Event Driven HFI & UAI Event Driven         | 0.73 |
| CS Global Macro HFI & UAI Macro                | 0.52 |
| CS Multi-strategy HFI & UAI Multi-strategy     | 0.38 |
| CS Equity Market Neutral HFI & UAI Equity Market Neutral | 0.18 |

Source: Compiled by author based on data from the Alix Capital UCITS Alternative and Credit Suisse Hedge Fund databases

### 4.4.2 Comparative analysis of the efficiency achieved by the different strategies

In this section, a comparative analysis between the efficiency achieved by the different strategies implemented by hedge funds and by UCITS funds will be carried out. In this regard, the strategies will be ranked according to their Sharpe and Treynor ratios.
4.4.2.1 Efficiency according to the Sharpe ratio

The following table shows the different indexes that have been analyzed ranked according to their 7-year Sharpe ratios.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Sharpe ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Credit Suisse Global Macro Hedge Fund Index 0.82</td>
</tr>
<tr>
<td>2</td>
<td>Credit Suisse Multi-Strategy Hedge Fund Index 0.80</td>
</tr>
<tr>
<td>3</td>
<td>UAI Fixed Income                  0.73</td>
</tr>
<tr>
<td>4</td>
<td>UAI Volatility                    0.66</td>
</tr>
<tr>
<td>5</td>
<td>Credit Suisse Event Driven Hedge Fund Index 0.62</td>
</tr>
<tr>
<td>6</td>
<td>Credit Suisse Hedge Fund Index    0.60</td>
</tr>
<tr>
<td>7</td>
<td>Credit Suisse Long/Short Equity Hedge Fund Index 0.52</td>
</tr>
<tr>
<td>8</td>
<td>UAI Multi-Strategy                0.52</td>
</tr>
<tr>
<td>9</td>
<td>Credit Suisse Fixed Income Arbitrage Hedge Fund Index 0.46</td>
</tr>
<tr>
<td>10</td>
<td>UAI Long/Short Equity             0.39</td>
</tr>
<tr>
<td>11</td>
<td>Credit Suisse Convertible Arbitrage Hedge Fund Index 0.38</td>
</tr>
<tr>
<td>12</td>
<td>UAI CTA                           0.36</td>
</tr>
<tr>
<td>13</td>
<td>Credit Suisse Managed Futures Hedge Fund Index 0.33</td>
</tr>
<tr>
<td>14</td>
<td>UCITS Alternative Index Global     0.32</td>
</tr>
<tr>
<td>15</td>
<td>UAI Macro                         0.31</td>
</tr>
<tr>
<td>16</td>
<td>Credit Suisse Emerging Markets Hedge Fund Index 0.23</td>
</tr>
<tr>
<td>17</td>
<td>UAI Emerging Markets              0.18</td>
</tr>
<tr>
<td>18</td>
<td>UAI Event Driven                  0.15</td>
</tr>
<tr>
<td>19</td>
<td>UAI Equity Market Neutral         -0.19</td>
</tr>
<tr>
<td>20</td>
<td>Credit Suisse Equity Market Neutral Hedge Fund Index -0.31</td>
</tr>
<tr>
<td>21</td>
<td>UAI Funds of Funds                -0.50</td>
</tr>
<tr>
<td>22</td>
<td>Credit Suisse Dedicated Short Bias Hedge Fund Index -0.87</td>
</tr>
</tbody>
</table>

Source: Compiled by author

According to the Sharpe ratio, the most efficient index in the last seven years has been the Credit Suisse Global Macro Hedge Fund Index, followed by the Credit Suisse Multi-Strategy Hedge Fund Index and by the UAI Fixed Income. In these cases, the indexes offered 0.82, 0.8 and 0.73 percentage points of net returns for each percentage point of total risk assumed. On the other hand, the less efficient index in the last seven years has been the Credit Suisse Dedicated Short Bias Hedge Fund Index, followed by the UAI Funds of Funds and by the Credit Suisse Equity Market Neutral Hedge Fund Index. In these cases, the indexes posted 0.87, 0.5 and 0.31 percentage points of net losses for each percentage point of total risk assumed. In other words, according to the Sharpe ratio, the most efficient strategy in the last seven years has been the global macro strategy implemented by hedge funds, while the least efficient strategy has been the dedicated short bias strategy.
4.4.2.2 Efficiency according to the Treynor ratio

The following table shows the different indexes that have been analyzed ranked according to their 7-year Treynor ratios.

<table>
<thead>
<tr>
<th>Rank</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>UAI Multi-Strategy</td>
<td>7.51</td>
</tr>
<tr>
<td>2</td>
<td>Credit Suisse Equity Market Neutral Hedge Fund Index</td>
<td>1.54</td>
</tr>
<tr>
<td>3</td>
<td>Credit Suisse Global Macro Hedge Fund Index</td>
<td>1.15</td>
</tr>
<tr>
<td>4</td>
<td>Credit Suisse Event Driven Hedge Fund Index</td>
<td>0.60</td>
</tr>
<tr>
<td>5</td>
<td>UAI Fixed Income</td>
<td>0.48</td>
</tr>
<tr>
<td>6</td>
<td>Credit Suisse Multi-Strategy Hedge Fund Index</td>
<td>0.48</td>
</tr>
<tr>
<td>7</td>
<td>Credit Suisse Hedge Fund Index</td>
<td>0.47</td>
</tr>
<tr>
<td>8</td>
<td>Credit Suisse Long/Short Equity Hedge Fund Index</td>
<td>0.44</td>
</tr>
<tr>
<td>9</td>
<td>UAI Long/Short Equity</td>
<td>0.33</td>
</tr>
<tr>
<td>10</td>
<td>UCITS Alternative Index Global</td>
<td>0.26</td>
</tr>
<tr>
<td>11</td>
<td>UAI Macro</td>
<td>0.24</td>
</tr>
<tr>
<td>12</td>
<td>Credit Suisse Fixed Income Arbitrage Hedge Fund Index</td>
<td>0.24</td>
</tr>
<tr>
<td>13</td>
<td>Credit Suisse Convertible Arbitrage Hedge Fund Index</td>
<td>0.20</td>
</tr>
<tr>
<td>14</td>
<td>Credit Suisse Emerging Markets Hedge Fund Index</td>
<td>0.17</td>
</tr>
<tr>
<td>15</td>
<td>UAI Emerging Markets</td>
<td>0.16</td>
</tr>
<tr>
<td>16</td>
<td>UAI Event Driven</td>
<td>0.10</td>
</tr>
<tr>
<td>17</td>
<td>UAI Volatility</td>
<td>-0.45</td>
</tr>
<tr>
<td>18</td>
<td>UAI Funds of Funds</td>
<td>-0.46</td>
</tr>
<tr>
<td>19</td>
<td>UAI CTA</td>
<td>-0.49</td>
</tr>
<tr>
<td>20</td>
<td>Credit Suisse Managed Futures Hedge Fund Index</td>
<td>-0.75</td>
</tr>
<tr>
<td>21</td>
<td>UAI Equity Market Neutral</td>
<td>-1.07</td>
</tr>
<tr>
<td>22</td>
<td>Credit Suisse Dedicated Short Bias Hedge Fund Index</td>
<td>-14.95</td>
</tr>
</tbody>
</table>

Source: Compiled by author

According to the Treynor ratio, the most efficient index in the last seven years has been the UAI Multi-Strategy, followed by the Credit Suisse Equity Market Neutral Hedge Fund Index and by the Credit Suisse Global Macro Hedge Fund Index. In these cases, the indexes offered 7.51, 1.54 and 1.15 percentage points of net returns for each percentage point of market risk taken. On the other hand, the less efficient index in the last seven years has been the Credit Suisse Dedicated Short Bias Hedge Fund Index, followed by the UAI Equity Market Neutral and by the Credit Suisse Managed Futures Hedge Fund Index. In these cases, the indexes offered 14.95, 1.07 and 0.75 percentage points of net losses for each percentage point of market risk taken. In other words, and according to the Treynor ratio, the most efficient index in the last seven years has been the multi-strategy index of UCITS funds, while the least efficient strategy has been the dedicated short bias strategy implemented by hedge funds.
4.4.2.3 Comparative of the efficiency according to the Sharpe and Treynor ratios

In the following chart, the different equivalent/comparable strategies implemented by hedge funds and by alternative UCITS funds have been represented according to their level of efficiency. In this regard, both the Sharpe and Treynor ratios of each strategy have been considered. In addition, it must be noted that the further to the right and up, the better. Therefore, and as can be seen, the comparable strategies implemented by hedge funds have been more efficient than those implemented by alternative UCITS funds in general terms, with the exception of the UAI Multi-Strategy, which took advantage of its really low beta.
Additionally, the following figures show, in a more clear and simple way, how mostly of the equivalent/comparable strategies implemented by hedge funds have outperformed those implemented by alternative UCITS in a risk-adjusted basis.

**Figure 44: Comparative of the efficiency of the equivalent/comparable strategies according to the Sharpe ratio**

**Last 7 years**

<table>
<thead>
<tr>
<th>Hedge funds</th>
<th>Alternative UCITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emerging markets</td>
<td>Emerging markets</td>
</tr>
<tr>
<td>Equity market neutral</td>
<td>Equity market neutral</td>
</tr>
<tr>
<td>Event driven</td>
<td>Event driven</td>
</tr>
<tr>
<td>Fixed income arbitrage</td>
<td>Fixed income</td>
</tr>
<tr>
<td>Global macro</td>
<td>Macro</td>
</tr>
<tr>
<td>Long/short equity</td>
<td>Long/short equity</td>
</tr>
<tr>
<td>Managed futures</td>
<td>CTA</td>
</tr>
<tr>
<td>Multi-strategy</td>
<td>Multi-strategy</td>
</tr>
<tr>
<td>Credit Suisse Hedge Fund Index</td>
<td>UCITS Alternative Index Global</td>
</tr>
</tbody>
</table>

Hedge Fund Index has higher Sharpe ratio

Alternative UCITS Index has higher Sharpe ratio

Source: Compiled by author

**Figure 45: Comparative of the efficiency of the equivalent/comparable strategies according to the Treynor ratio**

**Last 7 years**

<table>
<thead>
<tr>
<th>Hedge funds</th>
<th>Alternative UCITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emerging markets</td>
<td>Emerging markets</td>
</tr>
<tr>
<td>Equity market neutral</td>
<td>Equity market neutral</td>
</tr>
<tr>
<td>Event driven</td>
<td>Event driven</td>
</tr>
<tr>
<td>Fixed income arbitrage</td>
<td>Fixed income</td>
</tr>
<tr>
<td>Global macro</td>
<td>Macro</td>
</tr>
<tr>
<td>Long/short equity</td>
<td>Long/short equity</td>
</tr>
<tr>
<td>Managed futures</td>
<td>CTA</td>
</tr>
<tr>
<td>Multi-strategy</td>
<td>Multi-strategy</td>
</tr>
<tr>
<td>Credit Suisse Hedge Fund Index</td>
<td>UCITS Alternative Index Global</td>
</tr>
</tbody>
</table>

Hedge Fund Index has higher Treynor ratio

Alternative UCITS Index has higher Treynor ratio

Source: Compiled by author
As can be seen above, hedge funds have been more efficient than alternative UCITS in 5 out of 9 of the strategies that have been compared, while alternative UCITS have been more efficient than hedge funds only in 2 out of 9 of the strategies compared. In addition, there have been 2 strategies in which hedge funds have been more efficient according to the Sharpe/Treynor ratio than alternative UCITS, although less efficient according to the Treynor/Sharpe ratio.

Finally, the performance of each of the comparable/equivalent strategies in terms of risk-return is shown in the following graph. In this regard, it must be noted that, the further to the left and up, the better.
4.5 ANALYSIS OF THE PERFORMANCE OF MODEL PORTFOLIOS

In this section, an analysis of the performance of 3 model portfolios will be carried out in order to see how hedge funds and alternative UCITS may impact the performance of portfolios composed also of other different assets. The following table shows how the 3 model portfolios analyzed are composed:

<table>
<thead>
<tr>
<th>Table 142: Composition of the model portfolios analyzed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portfolio</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>A</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>B</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>C</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Source: Compiled by author

- As can be seen above, the Portfolio A will be composed of 2 assets, both with the same weight (50%): the S&P 500 and the Bloomberg Global Investment Grade Corporate Bond Index, which is a “USD denominated market-value weighted index engineered to measure investment grade, fixed-rate securities publicly issued in major domestic and euro-bond markets”.

- On the other hand, the Portfolio B will be composed of 3 assets: the S&P 500, the Bloomberg Global Investment Grade Corporate Bond Index, and the Credit Suisse Multi-strategy Hedge Fund Index. In this case, the S&P 500 and the Bloomberg Global Investment Grade Corporate Bond Index will have a weight

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192 For more information on the index, please visit the Bloomberg website at the following link: [http://www.bloomberg.com/quote/BCOR:IND](http://www.bloomberg.com/quote/BCOR:IND)
of a 40% each, while the Credit Suisse Multi-strategy Hedge Fund Index will have a weight of a 20%.

- Finally, the Portfolio C will be composed of 3 assets: the S&P 500, the Bloomberg Global Investment Grade Corporate Bond Index, and the UCITS Alternative Index Multi-strategy. In this case, the S&P 500 and the Bloomberg Global Investment Grade Corporate Bond Index will have a weight of a 40% each, while the UCITS Alternative Index Multi-strategy will have a weight of a 20%.

Regarding to the analysis conducted, it must be noted that, for each of the portfolios, the main performance metrics will be calculated. These metrics are the returns (in total and in annualized terms), the volatility, the beta of the portfolio, as well as the Sharpe and Treynor ratios. In the latter two cases and, in order to keep the consistency with the methodology implemented in the quantitative analysis carried out before, it has been used as risk free rate the 90-days Treasury-Bill rate of the 17-01-2015, which was of a 0.025%. In addition, the betas of the assets/instruments that compose the portfolios have been calculated by using the S&P 500 Index as a proxy of the market.

In addition, it must be highlighted that the metrics will be calculated for the last 5 years, that is, from January, 2010 to December, 2014.

### 4.5.1 Analysis of the performance of the Portfolio A

The main performance metrics of the Portfolio “A” are included in the following table:

<table>
<thead>
<tr>
<th>Table 143: Portfolio A (Main performance metrics)</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Table Image" /></td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from Bloomberg

The total return of the Portfolio A was of more than a 56.4% in the last five years. In annualized terms, the Portfolio achieved a return of a 9.36%. This high return can be explained mostly due to the great performance of the S&P 500 Index after the financial crisis.

On the other hand, the Portfolio has had an annualized volatility of more than a 6.5% in the last five years, which is a moderate level given the fact that the Portfolio invests half of its assets in the S&P 500. In this regard, the Bloomberg Global Investment Grade Corporate Bond Index helped to keep the volatility in a moderate level.
In terms of risk-adjusted return, the Sharpe ratio of the portfolio has been of 1.43 in the last five years, so it offered a net return of 1.43 percentage points for each percentage point of total risk assumed; while its Treynor ratio was of 0.20, indicating that it offered a net return of 0.2 percentage points for each percentage point of market risk taken. In addition, the beta of the Portfolio over the past five years was of 0.46, which indicates a medium level of positive correlation with market movements. This beta is explained due to the fact that the portfolio invests the 50% of its assets in the S&P 500\textsuperscript{193}.

### 4.5.2 Analysis of the performance of the Portfolio B

The main metrics calculated for the period analyzed of the Portfolio “B” are shown in the following table:

<table>
<thead>
<tr>
<th></th>
<th>Return (total)</th>
<th>Return (annualized)</th>
<th>Volatility (annualized)</th>
<th>Sharpe ratio</th>
<th>Treynor ratio</th>
<th>Portfolio Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 years</td>
<td>54.5%</td>
<td>9.1%</td>
<td>5.43%</td>
<td>1.67</td>
<td>0.25</td>
<td>0.37</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database and Bloomberg

The Portfolio B achieved a total return of almost a 54.6% in the last 5 years, which translates into a 9.1% in annualized terms. This high return is explained mostly by the great performance of the S&P 500 Index during the period.

In addition, the annualized volatility of the Portfolio in the last five years was of more than a 5.4%, a moderate level that is explained mostly due to the low level of volatility of the Bloomberg Global Investment Grade Corporate Bond Index.

On the other hand, and in terms of risk-adjusted return, the 5-year Sharpe ratio was of 1.67, indicating that the Portfolio offered 1.67 percentage points of net returns for each percentage point of total risk assumed. In addition, the Treynor ratio was of 0.25, indicating that the Portfolio offered 0.25 percentage points of net returns for each percentage point of non-diversifiable risk assumed.

Finally, the beta of the Portfolio was of 0.37, which indicates a medium-low level of positive correlation with market movements. In this regard, it must be said that the 40% of the Portfolio is invested in the S&P 500 Index, so its beta is pushed up to a medium positive level due to this aspect.

\textsuperscript{193} Note: In this analysis, the S&P 500 has been used as a proxy of the market, so its beta is 1.
4.5.3 Analysis of the performance of the Portfolio C

The following table summarizes the main results obtained after having analyzed the Portfolio C:

<table>
<thead>
<tr>
<th>Portfolio C (Main performance metrics)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Return (total)</strong></td>
</tr>
<tr>
<td>---------------------</td>
</tr>
<tr>
<td>5 years</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database and Bloomberg

The last of the portfolios analyzed achieved a total return of more than a 45.6% in the last 5 years. In annualized terms, the Portfolio C achieved a return of a 7.8%. Again, and as has happened with the other portfolios, the return achieved by the portfolio has been high mostly due to the fact that it invested the 40% of its assets in the S&P 500.

On the other hand, the Portfolio has had an annualized volatility of almost a 5.4% in the last five years, which is a moderate level given the fact that the Portfolio invests a high percentage of its assets in the S&P 500 Index. This moderate level can be explained due to the low volatility of the Bloomberg Global Investment Grade Corporate Bond Index during the period analyzed.

In terms of risk-adjusted return, the Sharpe ratio of the portfolio has been of 1.44 in the last five years, so it offered a net return of 1.44 percentage points for each percentage point of total risk assumed; while its Treynor ratio was of 0.21, indicating that it offered a net return of 0.21 percentage points for each percentage point of market risk taken. In addition, the beta of the Portfolio over the past five years was of 0.38, which indicates a medium level of positive correlation with market movements.

4.5.4 Comparative analysis of the performance of the model portfolios

The following table summarizes the performance of the model portfolios analyzed during the last 5 years:

<table>
<thead>
<tr>
<th>Summary of the performance of the model portfolios (last 5 years)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Return (total)</strong></td>
</tr>
<tr>
<td>--------------------</td>
</tr>
<tr>
<td>A</td>
</tr>
<tr>
<td>B</td>
</tr>
<tr>
<td>C</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Index & Alix Capital UCITS Alternative Databases and Bloomberg
As can be seen above, the Portfolio A has achieved the highest return in the last 5 years, followed by the portfolios B and C. This aspect is explained mostly due to the impressive performance of the S&P 500 Index during the period analyzed, in which the Portfolio A invested half of its assets, thus pushing up the return achieved to a higher level compared to the other portfolios. A comparative between the return achieved by each of the model portfolios in the last 5 years is shown in the following chart.

![Chart 123: Comparative between model portfolios](image)

**Source:** Compiled by author

In addition, the following chart shows the returns achieved by the model portfolios compared to the returns achieved by their components:

![Chart 124: Returns of model portfolios](image)

**Source:** Compiled by author based on data from the Credit Suisse Hedge Fund Index, AIAs Capital UCITS Alternative Database and Bloomberg

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On the other hand, it must be said that the annualized volatility of the portfolios has been moderate, particularly given the fact that all of them have invested a high percentage of their assets in the S&P 500 Index, which had a high level of volatility during the period. In this regard, the Portfolio C has had the lowest annualized volatility, followed by the portfolios B and A. This can be explained due to the fact that the Portfolio C took advantage of the lower volatilities of the Bloomberg Global Investment Grade Corporate Bond and UAI Multi-strategy indexes during the period. In this case, the combined position of the Portfolio C in both indexes was of a 60%, thus pushing down its annualized volatility.

The performance of the 3 model portfolios in terms of risk-return in the last 5 years is shown in the following chart. In this regard, it must be noted that, the further to the left and up, the better.

![Chart 125: Comparative between model portfolios 5-years performance](image)

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Index & Allix Capital UCITS Alternative Databases and Bloomberg

In terms of risk-adjusted return, the Portfolio B has been the most efficient, followed by the portfolios C and A. In this regard, the Portfolio B has had higher Sharpe and Treynor ratios than the other portfolios, which indicates that it achieved higher net returns for each percentage point of total risk assumed, as well as higher net returns for each percentage point of non-diversifiable risk assumed. This higher level of efficiency of the Portfolio B is explained by a combination of the higher returns of the S&P 500 and of the Credit Suisse Multi-strategy Hedge Fund Index, as well as due to the lower volatility levels of the Bloomberg Global Investment Grade Corporate Bond and Credit Suisse Multi-strategy Hedge Fund indexes. In the first case, the return of the Portfolio improved due to the great performance of a position that represented a 60% of its assets (S&P 500 & CS Multi-strategy HFI), while its volatility decreased thanks to the lower
volatility of a position that represented a 60% of the total assets of the Portfolio (Bloomberg GIGCB Index and CS Multi-strategy HFI).

In the following chart, the model portfolios have been represented according to their level of efficiency. In this regard, both the Sharpe and Treynor ratios of each portfolio have been considered. In addition, it must be noted that the further to the right and up, the better.

![Chart 126: Comparative between model portfolios Sharpe and Treynor ratios](image)

*Source: Compiled by author based on data from the Credit Suisse Hedge Fund Index & ALI Capital UCITS Alternative Databases and Bloomberg*

Finally, it must be highlighted that the betas of the portfolios indicate a moderate positive correlation with market movements. In this regard, the Portfolio B has had the lowest beta, since it took advantage of the very low beta of the CS Multi-strategy HFI during the period, followed by the portfolios C and A.
5. CONCLUSIONS

Due to the fact that the theoretical study of hedge funds and of UCITS funds is a compendium of the most important aspects included in the current literature, legislation, and documents written by specialists of the topic, the conclusions contained in this section will focus exclusively on the results to which has led the deep quantitative analysis of the performance of hedge funds and of UCITS funds included in the databases used in the study, as well as on the results of the analysis of the impact of hedge funds and UCITS in the model portfolios analyzed.

The main conclusions to which has led the analysis of the performance of the hedge funds included in the Credit Suisse Hedge Fund Database are the following:

1. The first relevant aspect to which has led the analysis conducted is the fact that the total returns achieved by the different strategies implemented by hedge funds have shown a high level of dispersion. Due to this aspect, investors must conduct a thorough analysis of each of the strategies before deciding to invest in any of them.

2. On the other hand, it must be said that most of the strategies implemented by hedge funds achieved superior returns than those of the main benchmark of the American equity market, the S&P 500, during the international financial crisis that began in 2007, with the exception of the equity market neutral strategy. This aspect shows that hedge funds have been able to deliver higher returns than the S&P 500 in an extreme market situation (the global financial crisis).

3. Also, it must be concluded that, in general terms, all indexes have shown a high level of volatility over the period analyzed. Therefore, investors must consider the great differences in terms of risk between strategies before carrying out the most appropriate investment according to their risk profile.

4. In terms of risk-adjusted return, it must be noted that, throughout the period analyzed, there have been important differences with respect to the efficiency achieved by each of the strategies analyzed. In this regard, there has been a great level of dispersion between the most and less efficient strategies. Also, there have been important differences depending on the metric used to measure the efficiency of the strategies.

5. Another important aspect that must be highlighted is that, in general terms, the different strategies implemented by hedge funds have presented a low correlation with market movements.
6. Other important aspects analyzed of each of the strategies implemented by hedge funds have been their best and worst months, as well as their maximum drawdowns and recovery times. In all these statistics, the strategies have presented great differences, so investors must conduct a thorough due diligence process of each of the strategies to understand the risk-return trade off before carrying out an investment.

7. Finally, it must be noted that the correlations between the different strategies have varied greatly over the past seven years. In this regard, those strategies that use the same instruments and assets have presented high levels of correlation, while those strategies that use different instruments and assets have shown low levels of correlation. In this regard, investors must know in detail the instruments used by each of the strategies in order to diversify their portfolios in the most appropriate way.

On the other hand, the analysis of the performance of the UCITS funds included in the Alternative UCITS Database of Alix Capital has led to the following conclusions:

8. As in the case of hedge funds, the total returns achieved by the different strategies implemented by alternative UCITS funds have shown a high level of dispersion, so investors must focus on these strategies that are able to deliver the highest return given specific market conditions.

9. On the other hand, it must be highlighted that all the strategies implemented by alternative UCITS funds achieved superior returns than those of the main benchmark of the American equity market, the S&P 500, during the international financial crisis that began in 2007. As hedge funds, alternative UCITS have been able to deliver higher returns than the S&P 500 in an extreme market situation.

10. Another important conclusion to which has led the analysis of the performance of the different indexes of alternative UCITS funds included in the database, is the fact that there have been significant differences between the volatilities of each of the strategies. In this regard, investors must understand, in a clear and simple way, the main risks that they are facing when investing on each of the strategies before carrying out an investment.

11. In terms of risk-adjusted return, it must be noted that, throughout the period analyzed, there have been important differences with respect to the efficiency achieved by each of the strategies analyzed. Also, and as in the case of hedge funds, there have been important differences depending on the metric used to measure the efficiency of the strategies.
12. Also, it must be concluded that, in general terms, the different strategies implemented by alternative UCITS funds have presented a low correlation with market movements.

13. Other important aspects analyzed of each of the strategies implemented by alternative UCITS funds have been their best and worst months, as well as their maximum drawdowns and recovery times. In all these metrics, there have been great divergences between strategies, so investors must analyze each of the strategies in depth in order to understand the risk-return trade off before deciding to invest in any of them.

14. Finally, it must be said that the correlations between the different strategies have varied greatly over the past seven years. As in the case of hedge funds, those strategies that use the same instruments and assets have presented high levels of correlation, while those strategies that use different instruments and assets have shown low levels of correlation. Therefore and, in order to diversify their portfolios in a correct manner, investors must understand the instruments used by each of the strategies.

Moreover, the main conclusions to which has led the comparative analysis between the performance of the comparable or equivalent strategies implemented by hedge funds and by alternative UCITS funds are the following:

15. In terms of total returns, it must be said that, in general terms, hedge fund indexes have achieved higher returns than the equivalent alternative UCITS funds indexes in the period analyzed.

In this regard, it must be concluded that the higher liquidity of UCITS funds has had a negative impact in the performance of these instruments compared to hedge funds, mostly due to the restrictions and obligations introduced by the legislation applicable to the UCITS funds industry.

16. On the other hand, the annualized volatility of hedge fund indexes has been higher than that of the equivalent alternative UCITS funds indexes in all the period. In this regard, it must be concluded that the level of risk of hedge fund indexes has been higher than that of the equivalent alternative UCITS funds indexes throughout the period analyzed. Therefore, all those investors who are considering to carry out an investment in hedge funds, must have a higher risk profile, as potential losses are higher.

17. In terms of risk-adjusted return, and according to the Sharpe and Treynor ratios, the hedge fund indexes analyzed have been more efficient, in general terms, than the equivalent alternative UCITS fund indexes during the period analyzed. In this case, the only notable exception is the UAI Multi-strategy, which achieved a really high Treynor ratio, as it took advantage of its really low beta.
18. In addition, it must be said that the alternative UCITS funds indexes that have best replicated the performance of their equivalent/comparable hedge fund indexes have been the UCI CTA, the UAI Emerging Markets and the UAI Long/Short Equity according to the Sharpe ratio, as well as the UAI Emerging Markets and the UAI Long/Short Equity according to the Treynor ratio.

19. Another important aspect that must be highlighted is that, in general terms, all the indexes analyzed have had a low or very low level of correlation with market movements, since the betas of the different indexes of hedge funds and of alternative UCITS funds have been at a level close to zero. Therefore, it must be concluded that both alternative UCITS funds and hedge funds may be used by investors to diversify their portfolios, since their market exposure has been low during the period analyzed. Also, it must be said that this conclusion is aligned with one of the main objectives of hedge funds and of alternative UCITS, which is none other than the search for absolute returns regardless of market movements.

20. At their best months and, in general terms, hedge fund indexes have achieved higher returns than the equivalent alternative UCITS funds indexes during the period analyzed. This aspect can be explained mostly due to the greater flexibility of hedge funds compared to UCITS funds.

Moreover, at their worst months, hedge fund indexes posted higher losses, in general terms, than the equivalent alternative UCITS funds indexes. This conclusion is aligned with the higher levels of volatility/risk of hedge funds compared to alternative UCITS funds, as well as with the different rules applicable to UCITS funds when carrying out their investments aimed to protect the interests of investors.

21. On the other hand, it must be noted that, in general terms, hedge fund indexes have had higher maximum drawdowns than the equivalent alternative UCITS funds indexes during the period analyzed. This aspect, again, may be explained mostly due to the fact that the regulation applicable to the UCITS funds industry includes different obligations relating to risk management procedures that are aimed at protecting the interests of investors.

In addition, and in general terms, the recovery times of the maximum drawdowns of hedge fund indexes have been higher than that of the alternative UCITS funds indexes over the whole period analyzed. Therefore, all investors who are considering an investment in hedge funds, must have enough capacity not only to face higher losses, but also to remain invested for a longer period of time in order to recover possible losses that may arise.

22. After having analyzed the correlation between equivalent strategies, it must also be highlighted that the equivalent strategies implemented by hedge funds and by alternative UCITS funds have had, in most of the cases, a high or very high positive correlation in the last seven years.
23. As a final remark, it must be said that, in the last years, the assets under management of alternative UCITS have grown very fast to a considerable level, mostly due to the fact that certain alternative investment funds are deciding to implement alternative strategies through traditional investment vehicles in order to attract retail, ultra-high net worth, as well as certain institutional investors that, for different reasons, may not invest in less regulated investment vehicles, such as hedge funds. However, it is not clear if, in the near future, these strategies will be able to achieve similar returns than those achieved by less regulated, and thus more flexible, investment vehicles, particularly due to the different restrictions, obligations and requirements included in the regulation applicable to the UCITS funds industry.

Finally, the study of the impact of hedge funds and of alternative UCITS in the three model portfolios analyzed has led to the following conclusions:

24. The Portfolio A, which invested the 50% of its assets in the S&P 500 Index and the other 50% in the Bloomberg Global Investment Grade Corporate Bond Index, achieved the highest return, as it took advantage of the impressive performance of the main benchmark of the American equity market.

25. On the other hand, the Portfolio C, which invested the 40% of its assets in the S&P500 Index, the 40% in the Bloomberg Global Investment Grade Corporate Bond Index, and the last 20% in the UAI Multi-strategy Index, has had the lowest annualized volatility, as it took advantage of the lower volatilities of the latter two above mentioned indexes.

26. In terms of risk-adjusted return, the Portfolio B, which invested the 40% of its assets in the S&P500 Index, the 40% in the Bloomberg Global Investment Grade Corporate Bond Index, and the last 20% in the Credit Suisse Multi-strategy Index, has been the most efficient, as it achieved higher Sharpe and Treynor ratios than the other portfolios. In this case, the Portfolio took advantage of a combination of the higher returns of the S&P 500 and of the Credit Suisse Multi-strategy Hedge Fund Index, as well as of the lower volatility levels of the Bloomberg Global Investment Grade Corporate Bond and Credit Suisse Multi-strategy Hedge Fund indexes.

27. Finally, the betas of the portfolios indicate a moderate positive correlation with market movements. In this regard, the Portfolio B has had the lowest beta, since it took advantage of the very low beta of the CS Multi-strategy HFI during the period, followed by the portfolios C and A.
6. REFERENCES

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http://kestrelmanagement.com/
http://news.morningstareurope.com/
http://online.wsj.com/
http://papers.ssrn.com/
http://pcaobus.org/
http://pwc.blogs.com/
http://www.adviserinfo.sec.gov/
http://www.aima.org/
http://www.alixcapital.com/
http://www.amf-france.org/
http://www.awjones.com/
http://www.bafin.de/
http://www.bankofengland.co.uk/
http://www.barchart.com/
http://www.barclayhedge.com/
http://www.bloombergbriefs.com/
http://www.cboe.com/
http://www.cbr.ru/eng/
http://www.centralbank.ie/
http://www.cftc.gov/
http://www.citibank.com/
http://www.nytimes.com/
https://www.preqin.com/
http://www.raymondjames.com/
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A. APPENDIX

I. HEDGE FUNDS STRATEGIES PERFORMANCE METRICS

1. Credit Suisse Hedge Fund Index

<table>
<thead>
<tr>
<th></th>
<th>Return (total)</th>
<th>Return (annualized)</th>
<th>Volatility (monthly)</th>
<th>Volatility (annualized)</th>
<th>Sharpe ratio</th>
<th>Treynor ratio</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>4.40%</td>
<td>4.45%</td>
<td>0.85%</td>
<td>2.93%</td>
<td>1.59</td>
<td>-0.17</td>
<td>-0.26</td>
</tr>
<tr>
<td>3 years</td>
<td>20.22%</td>
<td>6.33%</td>
<td>0.99%</td>
<td>3.34%</td>
<td>1.89</td>
<td>-1.71</td>
<td>-0.54</td>
</tr>
<tr>
<td>7 years</td>
<td>29.69%</td>
<td>3.77%</td>
<td>1.91%</td>
<td>6.30%</td>
<td>0.69</td>
<td>0.47</td>
<td>0.08</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

<table>
<thead>
<tr>
<th></th>
<th>Best month</th>
<th>Worst month</th>
<th>Maximum drawdown</th>
<th>Recovery time (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>1.72%</td>
<td>-0.80%</td>
<td>-0.29%</td>
<td>1</td>
</tr>
<tr>
<td>3 years</td>
<td>2.34%</td>
<td>-1.66%</td>
<td>0.00%</td>
<td>N/A</td>
</tr>
<tr>
<td>7 years</td>
<td>4.06%</td>
<td>-6.55%</td>
<td>-19.07%</td>
<td>16</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

2. Credit Suisse Convertible Arbitrage Hedge Fund Index

<table>
<thead>
<tr>
<th></th>
<th>Return (total)</th>
<th>Return (annualized)</th>
<th>Volatility (monthly)</th>
<th>Volatility (annualized)</th>
<th>Sharpe ratio</th>
<th>Treynor ratio</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>-3.69%</td>
<td>-3.69%</td>
<td>0.34%</td>
<td>3.25%</td>
<td>-1.14</td>
<td>-0.26</td>
<td>0.14</td>
</tr>
<tr>
<td>3 years</td>
<td>9.82%</td>
<td>3.17%</td>
<td>0.09%</td>
<td>3.07%</td>
<td>1.02</td>
<td>0.50</td>
<td>0.06</td>
</tr>
<tr>
<td>7 years</td>
<td>27.80%</td>
<td>3.57%</td>
<td>2.70%</td>
<td>9.34%</td>
<td>0.38</td>
<td>0.20</td>
<td>0.18</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

<table>
<thead>
<tr>
<th></th>
<th>Best month</th>
<th>Worst month</th>
<th>Maximum drawdown</th>
<th>Recovery time (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>2.09%</td>
<td>-1.79%</td>
<td>-1.68%</td>
<td>N/A</td>
</tr>
<tr>
<td>3 years</td>
<td>2.36%</td>
<td>-1.79%</td>
<td>0.00%</td>
<td>N/A</td>
</tr>
<tr>
<td>7 years</td>
<td>5.81%</td>
<td>-12.59%</td>
<td>-31.58%</td>
<td>12</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database
3. Credit Suisse Dedicated Short Bias Hedge Fund Index

Table 31: Credit Suisse Dedicated Short Bias Hedge Fund Index (Main performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>1 year</th>
<th>3 years</th>
<th>7 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return (total)</td>
<td>-4.57%</td>
<td>-38.98%</td>
<td>-63.09%</td>
</tr>
<tr>
<td>Return (annualized)</td>
<td>-4.57%</td>
<td>-15.18%</td>
<td>-13.24%</td>
</tr>
<tr>
<td>Volatility (monthly)</td>
<td>3.08%</td>
<td>11.07%</td>
<td>4.39%</td>
</tr>
<tr>
<td>Volatility (annualized)</td>
<td>10.66%</td>
<td>15.22%</td>
<td>15.22%</td>
</tr>
<tr>
<td>Sharpe ratio</td>
<td>-0.43</td>
<td>-1.37</td>
<td>-0.87</td>
</tr>
<tr>
<td>Treynor ratio</td>
<td>-0.07</td>
<td>-0.75</td>
<td>-1.495</td>
</tr>
<tr>
<td>Beta</td>
<td>0.64</td>
<td>0.20</td>
<td>0.01</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

Table 32: Credit Suisse Dedicated Short Bias Hedge Fund Index (Other performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>Best month</th>
<th>Worst month</th>
<th>Maximum drawdown</th>
<th>Recovery time (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>4.68%</td>
<td>-4.82%</td>
<td>-7.51%</td>
<td>N/A</td>
</tr>
<tr>
<td>3 years</td>
<td>9.03%</td>
<td>-7.58%</td>
<td>-44.74%</td>
<td>N/A</td>
</tr>
<tr>
<td>7 years</td>
<td>9.66%</td>
<td>-11.28%</td>
<td>-61.66%</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

4. Credit Suisse Emerging Markets Hedge Fund Index

Table 34: Credit Suisse Emerging Markets Hedge Fund Index (Main performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>1 year</th>
<th>3 years</th>
<th>7 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return (total)</td>
<td>3.89%</td>
<td>17.44%</td>
<td>17.68%</td>
</tr>
<tr>
<td>Return (annualized)</td>
<td>3.89%</td>
<td>5.50%</td>
<td>2.35%</td>
</tr>
<tr>
<td>Volatility (monthly)</td>
<td>1.29%</td>
<td>1.59%</td>
<td>2.25%</td>
</tr>
<tr>
<td>Volatility (annualized)</td>
<td>4.48%</td>
<td>5.51%</td>
<td>10.27%</td>
</tr>
<tr>
<td>Sharpe ratio</td>
<td>0.86</td>
<td>0.99</td>
<td>0.23</td>
</tr>
<tr>
<td>Treynor ratio</td>
<td>-0.11</td>
<td>-1.21</td>
<td>0.17</td>
</tr>
<tr>
<td>Beta</td>
<td>-0.34</td>
<td>-0.05</td>
<td>0.13</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

Table 35: Credit Suisse Emerging Markets Hedge Fund Index (Other performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>Best month</th>
<th>Worst month</th>
<th>Maximum drawdown</th>
<th>Recovery time (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>1.79%</td>
<td>-2.27%</td>
<td>-2.59%</td>
<td>3</td>
</tr>
<tr>
<td>3 years</td>
<td>3.74%</td>
<td>-3.79%</td>
<td>0.00%</td>
<td>N/A</td>
</tr>
<tr>
<td>7 years</td>
<td>6.96%</td>
<td>-13.63%</td>
<td>-31.96%</td>
<td>22</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database
5. Credit Suisse Equity Market Neutral Hedge Fund Index

Table 17: Credit Suisse Equity Market Neutral Hedge Fund Index (Main performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>Return (total)</th>
<th>Return (annualized)</th>
<th>Volatility (monthly)</th>
<th>Volatility (annualized)</th>
<th>Sharpe ratio</th>
<th>Treynor ratio</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>-1.27%</td>
<td>-1.27%</td>
<td>0.51%</td>
<td>1.79%</td>
<td>-0.73</td>
<td>0.14</td>
<td>-0.09</td>
</tr>
<tr>
<td>3 years</td>
<td>8.70%</td>
<td>2.52%</td>
<td>1.09%</td>
<td>3.78%</td>
<td>0.74</td>
<td>0.42</td>
<td>-0.07</td>
</tr>
<tr>
<td>7 years</td>
<td>-30.43%</td>
<td>-5.95%</td>
<td>4.67%</td>
<td>16.19%</td>
<td>-0.31</td>
<td>1.54</td>
<td>-0.03</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

Table 38: Credit Suisse Equity Market Neutral Hedge Fund Index (Other performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>Best month</th>
<th>Worst month</th>
<th>Maximum drawdown</th>
<th>Recovery time (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>0.70%</td>
<td>-0.70%</td>
<td>-1.52%</td>
<td>N/A</td>
</tr>
<tr>
<td>3 years</td>
<td>2.59%</td>
<td>-3.18%</td>
<td>-2.28%</td>
<td>4</td>
</tr>
<tr>
<td>7 years</td>
<td>3.66%</td>
<td>-40.45%</td>
<td>-43.03%</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

6. Credit Suisse Event Driven Hedge Fund Index

Table 40: Credit Suisse Event Driven Hedge Fund Index (Main performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>Return (total)</th>
<th>Return (annualized)</th>
<th>Volatility (monthly)</th>
<th>Volatility (annualized)</th>
<th>Sharpe ratio</th>
<th>Treynor ratio</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>1.28%</td>
<td>1.28%</td>
<td>1.31%</td>
<td>4.53%</td>
<td>0.28</td>
<td>-0.05</td>
<td>-0.26</td>
</tr>
<tr>
<td>3 years</td>
<td>26.21%</td>
<td>8.97%</td>
<td>1.21%</td>
<td>4.20%</td>
<td>1.91</td>
<td>-1.26</td>
<td>-0.06</td>
</tr>
<tr>
<td>7 years</td>
<td>34.86%</td>
<td>4.36%</td>
<td>2.01%</td>
<td>4.96%</td>
<td>0.62</td>
<td>0.69</td>
<td>0.07</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

Table 41: Credit Suisse Event Driven Hedge Fund Index (Other performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>Best month</th>
<th>Worst month</th>
<th>Maximum drawdown</th>
<th>Recovery time (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>2.75%</td>
<td>-2.16%</td>
<td>0.00%</td>
<td>N/A</td>
</tr>
<tr>
<td>3 years</td>
<td>2.80%</td>
<td>-2.16%</td>
<td>0.00%</td>
<td>N/A</td>
</tr>
<tr>
<td>7 years</td>
<td>4.22%</td>
<td>-5.75%</td>
<td>-18.93%</td>
<td>11</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database
7. Credit Suisse Fixed Income Arbitrage Hedge Fund Index

<table>
<thead>
<tr>
<th></th>
<th>Return (total)</th>
<th>Return (annualized)</th>
<th>Volatility (monthly)</th>
<th>Volatility (annualized)</th>
<th>Sharpe ratio</th>
<th>Treynor ratio</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>3.34%</td>
<td>3.34%</td>
<td>0.30%</td>
<td>1.03%</td>
<td>3.21</td>
<td>0.54</td>
<td>0.06</td>
</tr>
<tr>
<td>3 years</td>
<td>18.90%</td>
<td>5.94%</td>
<td>0.48%</td>
<td>1.65%</td>
<td>3.59</td>
<td>-12.23</td>
<td>-0.065</td>
</tr>
<tr>
<td>7 years</td>
<td>28.14%</td>
<td>3.61%</td>
<td>2.25%</td>
<td>7.80%</td>
<td>0.46</td>
<td>0.24</td>
<td>0.15</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

8. Credit Suisse Global Macro Hedge Fund Index

<table>
<thead>
<tr>
<th></th>
<th>Best month</th>
<th>Worst month</th>
<th>Maximum drawdown</th>
<th>Recovery time (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>1.00%</td>
<td>-0.10%</td>
<td>0.00%</td>
<td>N/A</td>
</tr>
<tr>
<td>3 years</td>
<td>1.62%</td>
<td>-1.14%</td>
<td>0.00%</td>
<td>N/A</td>
</tr>
<tr>
<td>7 years</td>
<td>4.33%</td>
<td>-14.04%</td>
<td>-20.83%</td>
<td>22</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database
9. Credit Suisse Long/Short Equity Hedge Fund Index

Table 49: Credit Suisse Long/Short Equity Hedge Fund Index (Main performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>Return (total)</th>
<th>Return (annualized)</th>
<th>Volatility (monthly)</th>
<th>Volatility (annualized)</th>
<th>Sharpe ratio</th>
<th>Treynor ratio</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>5.63%</td>
<td>5.63%</td>
<td>1.28%</td>
<td>4.41%</td>
<td>1.27</td>
<td>-0.17</td>
<td>-0.34</td>
</tr>
<tr>
<td>3 years</td>
<td>29.41%</td>
<td>8.97%</td>
<td>1.60%</td>
<td>5.54%</td>
<td>1.61</td>
<td>-1.45</td>
<td>-0.062</td>
</tr>
<tr>
<td>7 years</td>
<td>36.68%</td>
<td>4.50%</td>
<td>2.48%</td>
<td>8.58%</td>
<td>0.52</td>
<td>0.44</td>
<td>0.10</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

Table 50: Credit Suisse Long/Short Equity Hedge Fund Index (Other performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>Best month</th>
<th>Worst month</th>
<th>Maximum drawdown</th>
<th>Recovery time (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>2.88%</td>
<td>-1.19%</td>
<td>-0.08%</td>
<td>1</td>
</tr>
<tr>
<td>3 years</td>
<td>3.91%</td>
<td>-4.53%</td>
<td>0.00%</td>
<td>N/A</td>
</tr>
<tr>
<td>7 years</td>
<td>5.23%</td>
<td>-7.81%</td>
<td>-20.95%</td>
<td>20</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

10. Credit Suisse Managed Futures Hedge Fund Index

Table 52: Credit Suisse Managed Futures Hedge Fund Index (Main performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>Return (total)</th>
<th>Return (annualized)</th>
<th>Volatility (monthly)</th>
<th>Volatility (annualized)</th>
<th>Sharpe ratio</th>
<th>Treynor ratio</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>22.56%</td>
<td>22.56%</td>
<td>2.93%</td>
<td>10.14%</td>
<td>2.22</td>
<td>-0.23</td>
<td>-0.06</td>
</tr>
<tr>
<td>3 years</td>
<td>10.69%</td>
<td>3.44%</td>
<td>2.90%</td>
<td>10.03%</td>
<td>0.34</td>
<td>-0.84</td>
<td>-0.041</td>
</tr>
<tr>
<td>7 years</td>
<td>27.80%</td>
<td>3.57%</td>
<td>3.10%</td>
<td>10.73%</td>
<td>0.33</td>
<td>-0.75</td>
<td>-0.05</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

Table 53: Credit Suisse Managed Futures Hedge Fund Index (Other performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>Best month</th>
<th>Worst month</th>
<th>Maximum drawdown</th>
<th>Recovery time (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>7.50%</td>
<td>-3.42%</td>
<td>-4.29%</td>
<td>3</td>
</tr>
<tr>
<td>3 years</td>
<td>7.50%</td>
<td>-5.42%</td>
<td>-10.16%</td>
<td>12</td>
</tr>
<tr>
<td>7 years</td>
<td>7.50%</td>
<td>-5.42%</td>
<td>0.00%</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database
11. Credit Suisse Multi-Strategy Hedge Fund Index

Table 55: Credit Suisse Multi-Strategy Hedge Fund Index (Main performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>Return (total)</th>
<th>Return (annualized)</th>
<th>Volatility (monthly)</th>
<th>Volatility (annualized)</th>
<th>Sharpe ratio</th>
<th>Treynor ratio</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>5.24%</td>
<td>5.24%</td>
<td>0.64%</td>
<td>2.22%</td>
<td>2.35</td>
<td>-0.67</td>
<td>-0.08</td>
</tr>
<tr>
<td>3 years</td>
<td>28.05%</td>
<td>8.59%</td>
<td>0.70%</td>
<td>2.72%</td>
<td>3.15</td>
<td>-4.20</td>
<td>-0.02</td>
</tr>
<tr>
<td>7 years</td>
<td>41.55%</td>
<td>5.09%</td>
<td>1.84%</td>
<td>6.36%</td>
<td>0.80</td>
<td>0.48</td>
<td>0.10</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

Table 56: Credit Suisse Multi-Strategy Hedge Fund Index (Other performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>Best month</th>
<th>Worst month</th>
<th>Maximum drawdown</th>
<th>Recovery time (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>1.41%</td>
<td>-0.49%</td>
<td>0.00%</td>
<td>N/A</td>
</tr>
<tr>
<td>3 years</td>
<td>2.47%</td>
<td>-1.17%</td>
<td>0.00%</td>
<td>N/A</td>
</tr>
<tr>
<td>7 years</td>
<td>4.28%</td>
<td>-7.35%</td>
<td>-23.64%</td>
<td>22</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database

12. Correlation between hedge funds strategies

Table 68: Comparative analysis of hedge fund strategies: Correlation

<table>
<thead>
<tr>
<th></th>
<th>CA</th>
<th>DS</th>
<th>EM</th>
<th>EMN</th>
<th>ED</th>
<th>HA</th>
<th>GM</th>
<th>L/SE</th>
<th>MF</th>
<th>Multi-strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA</td>
<td>1</td>
<td>-0.35</td>
<td>0.78</td>
<td>0.20</td>
<td>0.73</td>
<td>0.87</td>
<td>0.56</td>
<td>0.68</td>
<td>-0.09</td>
<td>0.88</td>
</tr>
<tr>
<td>DS</td>
<td></td>
<td>1</td>
<td>-0.60</td>
<td>-0.27</td>
<td>-0.64</td>
<td>-0.36</td>
<td>-0.07</td>
<td>-0.72</td>
<td>0.08</td>
<td>-0.49</td>
</tr>
<tr>
<td>EM</td>
<td></td>
<td></td>
<td>1</td>
<td>0.26</td>
<td>0.83</td>
<td>0.75</td>
<td>0.59</td>
<td>0.90</td>
<td>0.11</td>
<td>0.87</td>
</tr>
<tr>
<td>EMN</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>0.37</td>
<td>0.37</td>
<td>0.95</td>
<td>0.28</td>
<td>-0.04</td>
<td>0.45</td>
</tr>
<tr>
<td>ED</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>0.63</td>
<td>0.47</td>
<td>0.89</td>
<td>0.09</td>
<td>0.86</td>
</tr>
<tr>
<td>HA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>0.53</td>
<td>0.59</td>
<td>-0.10</td>
<td>0.81</td>
</tr>
<tr>
<td>GM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>0.50</td>
<td>0.55</td>
<td>0.56</td>
</tr>
<tr>
<td>L/SE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>0.15</td>
<td>0.85</td>
</tr>
<tr>
<td>MF</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>0.03</td>
</tr>
<tr>
<td>Multi-strategy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Credit Suisse Hedge Fund Database
II. UCITS FUNDS STRATEGIES PERFORMANCE METRICS

1. UCITS Alternative Index Global

Table 69: UCITS Alternative Index Global (Main performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>Return (total)</th>
<th>Return (annualized)</th>
<th>Volatility (monthly)</th>
<th>Volatility (annualized)</th>
<th>Sharp ratio</th>
<th>Treynor ratio</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>1,80%</td>
<td>1,80%</td>
<td>0,55%</td>
<td>1,90%</td>
<td>0,94</td>
<td>-0,12</td>
<td>-0,15</td>
</tr>
<tr>
<td>3 years</td>
<td>5,88%</td>
<td>1,92%</td>
<td>0,65%</td>
<td>2,24%</td>
<td>0,85</td>
<td>-0,74</td>
<td>-0,03</td>
</tr>
<tr>
<td>7 years</td>
<td>8,13%</td>
<td>1,12%</td>
<td>0,99%</td>
<td>3,43%</td>
<td>0,32</td>
<td>0,26</td>
<td>0,04</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database

Table 70: UCITS Alternative Index Global (Other performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>Best month</th>
<th>Worst month</th>
<th>Maximum drawdown</th>
<th>Recovery time (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>1,06%</td>
<td>-0,39%</td>
<td>-0,38%</td>
<td>1</td>
</tr>
<tr>
<td>3 years</td>
<td>1,36%</td>
<td>-1,37%</td>
<td>-0,34%</td>
<td>1</td>
</tr>
<tr>
<td>7 years</td>
<td>2,19%</td>
<td>-3,97%</td>
<td>-8,18%</td>
<td>10</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database

2. UCITS Alternative Index Volatility

Table 71: UAI Volatility (Main performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>Return (total)</th>
<th>Return (annualized)</th>
<th>Volatility (monthly)</th>
<th>Volatility (annualized)</th>
<th>Sharp ratio</th>
<th>Treynor ratio</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>-0,97%</td>
<td>-0,97%</td>
<td>0,30%</td>
<td>0,05%</td>
<td>-0,95</td>
<td>-6,19</td>
<td>0,002</td>
</tr>
<tr>
<td>3 years</td>
<td>-5,30%</td>
<td>-1,80%</td>
<td>0,44%</td>
<td>1,55%</td>
<td>-1,20</td>
<td>-0,54</td>
<td>0,03</td>
</tr>
<tr>
<td>7 years</td>
<td>14,47%</td>
<td>1,95%</td>
<td>0,84%</td>
<td>2,90%</td>
<td>0,66</td>
<td>-0,45</td>
<td>-0,04</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database

Table 72: UAI Volatility (Other performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>Best month</th>
<th>Worst month</th>
<th>Maximum drawdown</th>
<th>Recovery time (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>0,49%</td>
<td>-0,69%</td>
<td>-1,54%</td>
<td>N/A</td>
</tr>
<tr>
<td>3 years</td>
<td>1,03%</td>
<td>-1,41%</td>
<td>-5,75%</td>
<td>N/A</td>
</tr>
<tr>
<td>7 years</td>
<td>2,89%</td>
<td>-1,70%</td>
<td>0,00%</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database
3. UCITS Alternative Index Funds of Funds

<table>
<thead>
<tr>
<th>Table 74: UAI Funds of Funds (Main performance metrics)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Return (total)</strong></td>
</tr>
<tr>
<td>1 year</td>
</tr>
<tr>
<td>3 years</td>
</tr>
<tr>
<td>7 years</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database

<table>
<thead>
<tr>
<th>Table 75: UAI Funds of Funds (Other performance metrics)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Best month</strong></td>
</tr>
<tr>
<td>1 year</td>
</tr>
<tr>
<td>3 years</td>
</tr>
<tr>
<td>7 years</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database

4. UCITS Alternative Index Emerging Markets

<table>
<thead>
<tr>
<th>Table 77: UAI Emerging Markets (Main performance metrics)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Return (total)</strong></td>
</tr>
<tr>
<td>1 year</td>
</tr>
<tr>
<td>3 years</td>
</tr>
<tr>
<td>7 years</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database

<table>
<thead>
<tr>
<th>Table 78: UAI Emerging Markets (Other performance metrics)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Best month</strong></td>
</tr>
<tr>
<td>1 year</td>
</tr>
<tr>
<td>3 years</td>
</tr>
<tr>
<td>7 years</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database
5. UCITS Alternative Index Equity Market Neutral

Table 80: UAI Equity Market Neutral (Main performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>Return (total)</th>
<th>Return (annualized)</th>
<th>Volatility (monthly)</th>
<th>Volatility (annualized)</th>
<th>Sharpe ratio</th>
<th>Treynor ratio</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>0.10%</td>
<td>0.10%</td>
<td>0.43%</td>
<td>1.48%</td>
<td>0.05</td>
<td>-0.05</td>
<td>-0.014</td>
</tr>
<tr>
<td>3 years</td>
<td>1.51%</td>
<td>0.50%</td>
<td>0.39%</td>
<td>1.35%</td>
<td>0.35</td>
<td>0.56</td>
<td>0.01</td>
</tr>
<tr>
<td>7 years</td>
<td>-2.33%</td>
<td>-0.34%</td>
<td>0.55%</td>
<td>1.89%</td>
<td>-0.19</td>
<td>-1.07</td>
<td>0.003</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database

Table 81: UAI Equity Market Neutral (Other performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>Best month</th>
<th>Worst month</th>
<th>Maximum drawdown</th>
<th>Recovery time (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>0.51%</td>
<td>-0.89%</td>
<td>-0.74%</td>
<td>4</td>
</tr>
<tr>
<td>3 years</td>
<td>0.71%</td>
<td>-0.89%</td>
<td>-1.50%</td>
<td>15</td>
</tr>
<tr>
<td>7 years</td>
<td>1.22%</td>
<td>-2.54%</td>
<td>-5.46%</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database

6. UCITS Alternative Index Event Driven

Table 83: UAI Event Driven (Main performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>Return (total)</th>
<th>Return (annualized)</th>
<th>Volatility (monthly)</th>
<th>Volatility (annualized)</th>
<th>Sharpe ratio</th>
<th>Treynor ratio</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>-1.76%</td>
<td>-1.76%</td>
<td>0.80%</td>
<td>2.78%</td>
<td>-0.64</td>
<td>0.10</td>
<td>-0.18</td>
</tr>
<tr>
<td>3 years</td>
<td>0.78%</td>
<td>0.26%</td>
<td>0.85%</td>
<td>2.55%</td>
<td>0.08</td>
<td>-0.16</td>
<td>-0.01</td>
</tr>
<tr>
<td>7 years</td>
<td>4.00%</td>
<td>0.56%</td>
<td>1.06%</td>
<td>3.69%</td>
<td>0.15</td>
<td>0.10</td>
<td>0.05</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database

Table 84: UAI Event Driven (Other performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>Best month</th>
<th>Worst month</th>
<th>Maximum drawdown</th>
<th>Recovery time (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>1.01%</td>
<td>-1.94%</td>
<td>-2.71%</td>
<td>N/A</td>
</tr>
<tr>
<td>3 years</td>
<td>1.54%</td>
<td>-1.94%</td>
<td>-2.01%</td>
<td>5</td>
</tr>
<tr>
<td>7 years</td>
<td>2.17%</td>
<td>-4.59%</td>
<td>-8.36%</td>
<td>21</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database
7. UCITS Alternative Index Fixed Income

Table 86: UAF Fixed Income (Main performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>Return (total)</th>
<th>Return (annualized)</th>
<th>Volatility (monthly)</th>
<th>Volatility (annualized)</th>
<th>Sharpe ratio</th>
<th>Treynor ratio</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>0,73%</td>
<td>0,73%</td>
<td>0,24%</td>
<td>0,83%</td>
<td>0,85</td>
<td>0,81</td>
<td>0,069</td>
</tr>
<tr>
<td>3 years</td>
<td>6,88%</td>
<td>2,24%</td>
<td>0,33%</td>
<td>1,13%</td>
<td>1,96</td>
<td>9,86</td>
<td>0,002</td>
</tr>
<tr>
<td>7 years</td>
<td>15,74%</td>
<td>2,11%</td>
<td>0,83%</td>
<td>2,87%</td>
<td>0,73</td>
<td>0,48</td>
<td>0,04</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database

Table 87: UAF Fixed Income (Other performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>Best month</th>
<th>Worst month</th>
<th>Maximum drawdown</th>
<th>Recovery time (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>0,45%</td>
<td>-0,38%</td>
<td>0,00%</td>
<td>N/A</td>
</tr>
<tr>
<td>3 years</td>
<td>0,96%</td>
<td>-0,68%</td>
<td>0,00%</td>
<td>N/A</td>
</tr>
<tr>
<td>7 years</td>
<td>2,02%</td>
<td>-4,58%</td>
<td>-7,65%</td>
<td>5</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database

8. UCITS Alternative Index Macro

Table 89: UAF Macro (Main performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>Return (total)</th>
<th>Return (annualized)</th>
<th>Volatility (monthly)</th>
<th>Volatility (annualized)</th>
<th>Sharpe ratio</th>
<th>Treynor ratio</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>2,29%</td>
<td>2,29%</td>
<td>0,55%</td>
<td>1,91%</td>
<td>1,18</td>
<td>-0,15</td>
<td>-0,16</td>
</tr>
<tr>
<td>3 years</td>
<td>4,21%</td>
<td>1,38%</td>
<td>0,33%</td>
<td>2,54%</td>
<td>0,54</td>
<td>-0,90</td>
<td>-0,015</td>
</tr>
<tr>
<td>7 years</td>
<td>7,39%</td>
<td>1,08%</td>
<td>0,98%</td>
<td>3,40%</td>
<td>0,31</td>
<td>0,24</td>
<td>0,64</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database

Table 90: UAF Macro (Other performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>Best month</th>
<th>Worst month</th>
<th>Maximum drawdown</th>
<th>Recovery time (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>1,11%</td>
<td>-0,57%</td>
<td>-0,57%</td>
<td>1</td>
</tr>
<tr>
<td>3 years</td>
<td>1,70%</td>
<td>-2,15%</td>
<td>-0,16%</td>
<td>1</td>
</tr>
<tr>
<td>7 years</td>
<td>2,42%</td>
<td>-3,87%</td>
<td>-8,33%</td>
<td>9</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database
9. UCITS Alternative Index Long/Short Equity

Table 92: UAI Long/Short Equity (Main performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>Return (total)</th>
<th>Return (annualized)</th>
<th>Volatility (monthly)</th>
<th>Volatility (annualized)</th>
<th>Sharpe ratio</th>
<th>Treynor ratio</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>1,46%</td>
<td>1,46%</td>
<td>0,87%</td>
<td>3,00%</td>
<td>0,48</td>
<td>-0,07</td>
<td>-0,10</td>
</tr>
<tr>
<td>3 years</td>
<td>13,70%</td>
<td>4,37%</td>
<td>1,01%</td>
<td>3,51%</td>
<td>1,24</td>
<td>-0,61</td>
<td>-0,071</td>
</tr>
<tr>
<td>7 years</td>
<td>14,91%</td>
<td>2,00%</td>
<td>1,46%</td>
<td>5,06%</td>
<td>0,39</td>
<td>0,33</td>
<td>0,06</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database

Table 93: UAI Long/Short Equity (Other performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>Best month</th>
<th>Worst month</th>
<th>Maximum drawdown</th>
<th>Recovery time (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>1,34%</td>
<td>-0,98%</td>
<td>-0,09%</td>
<td>1</td>
</tr>
<tr>
<td>3 years</td>
<td>2,21%</td>
<td>-2,40%</td>
<td>-0,61%</td>
<td>2</td>
</tr>
<tr>
<td>7 years</td>
<td>3,28%</td>
<td>-5,07%</td>
<td>-12,83%</td>
<td>13</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database

10. UCITS Alternative Index CTA

Table 95: UAI CTA (Main performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>Return (total)</th>
<th>Return (annualized)</th>
<th>Volatility (monthly)</th>
<th>Volatility (annualized)</th>
<th>Sharpe ratio</th>
<th>Treynor ratio</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>12,75%</td>
<td>12,75%</td>
<td>1,71%</td>
<td>5,93%</td>
<td>2,15</td>
<td>-0,22</td>
<td>-0,59</td>
</tr>
<tr>
<td>3 years</td>
<td>7,11%</td>
<td>2,34%</td>
<td>1,61%</td>
<td>5,59%</td>
<td>0,41</td>
<td>-0,41</td>
<td>-0,06</td>
</tr>
<tr>
<td>7 years</td>
<td>13,69%</td>
<td>1,85%</td>
<td>1,44%</td>
<td>5,00%</td>
<td>0,36</td>
<td>-0,49</td>
<td>-0,04</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database

Table 96: UAI CTA (Other performance metrics)

<table>
<thead>
<tr>
<th></th>
<th>Best month</th>
<th>Worst month</th>
<th>Maximum drawdown</th>
<th>Recovery time (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>4,07%</td>
<td>-2,30%</td>
<td>-2,30%</td>
<td>4</td>
</tr>
<tr>
<td>3 years</td>
<td>4,07%</td>
<td>-2,85%</td>
<td>-6,08%</td>
<td>11</td>
</tr>
<tr>
<td>7 years</td>
<td>4,07%</td>
<td>-2,85%</td>
<td>0,00%</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database
11. UCITS Alternative Index Multi-Strategy

<table>
<thead>
<tr>
<th></th>
<th>Table 98: UAI Multi-Strategy (Main performance metrics)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Return (total)</td>
</tr>
<tr>
<td>1 year</td>
<td>2.22%</td>
</tr>
<tr>
<td>3 years</td>
<td>10.63%</td>
</tr>
<tr>
<td>7 years</td>
<td>10.51%</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database

<table>
<thead>
<tr>
<th></th>
<th>Table 99: UAI Multi-Strategy (Other performance metrics)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Best month</td>
</tr>
<tr>
<td>1 year</td>
<td>1.06%</td>
</tr>
<tr>
<td>3 years</td>
<td>1.54%</td>
</tr>
<tr>
<td>7 years</td>
<td>2.33%</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database

12. Correlation between UCITS funds strategies

<table>
<thead>
<tr>
<th></th>
<th>Table 111: Comparative analysis of alternative UCITS strategies: Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>V</td>
</tr>
<tr>
<td>V</td>
<td>1</td>
</tr>
<tr>
<td>FoF</td>
<td>1</td>
</tr>
<tr>
<td>EM</td>
<td>1</td>
</tr>
<tr>
<td>EMN</td>
<td>1</td>
</tr>
<tr>
<td>ED</td>
<td>1</td>
</tr>
<tr>
<td>FI</td>
<td>1</td>
</tr>
<tr>
<td>M</td>
<td>1</td>
</tr>
<tr>
<td>L/SE</td>
<td>1</td>
</tr>
<tr>
<td>CTA</td>
<td>1</td>
</tr>
<tr>
<td>Multi-strategy</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on data from the Alix Capital UCITS Alternative Database
III. REGULATION IN THE US

1. Securities Act of 1933

The first of the laws affecting the operations of hedge funds in the United States is none other than the Securities Act of 1933\(^{194}\). The two basic objectives of the Act are shown in the following table.

<table>
<thead>
<tr>
<th>Securities Act of 1933 Main Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>To require that investors receive financial and other significant information concerning securities being offered for public sale</td>
</tr>
<tr>
<td>To prohibit deceit, misrepresentations, and other fraud in the sale of securities</td>
</tr>
</tbody>
</table>

Source: Compiled by author based on Securities Act of 1933

However, the Act also had other objectives. Among the most important objectives outlined in the Act, are the obligation to register some securities offered publicly with the SEC with the aim that the information contained in the registry of the Commission could be accessed at all times required by those who wish to, helping such investors to make investment decisions based on information that is as close to reality as possible.

Nevertheless, it should be noted that, regardless of whether the SEC requested that the information about some securities needs to be registered in the most accurate way, the Commission does not supervise if the information is true or not or, in other words, does not guarantee the complete accuracy of the information. This aspect can be seen sometimes as negative from the point of view of investors, because they are the ones who have to determine if a given information registered is consistent or not though, however, they have a large number of mechanisms to exercise their rights if they have been ripped off at a certain time, but for that they need to prove that the information about a certain security contained in this register is inaccurate, incomplete, or has ignored relevant information for making investment decisions.

With regard to the registration process of securities, it must be said that it is complex and costly, given the large amount of information that usually needs to be registered by all those firms that issue securities that may be purchased by the general public. Within

\(^{194}\) Also known in the Unites States as the “Truth in Securities Act”. An online version of the Act is available online at the following link: [http://www.sec.gov/about/laws/sa33.pdf](http://www.sec.gov/about/laws/sa33.pdf)
this information\textsuperscript{195}, the company must include aspects such as detailed information on the activities undertaken; its main assets; information on all individuals who are in charge of managing the operations of the company; a comprehensive description of the type of security offered to the public, including risks associated; as well as a clear report of the financial statements of the company audited by an independent auditor. In recent years, due to the rise of new technologies, all companies, either domestic or foreign, who have to register their securities traded with the SEC, can do it electronically so that, once done, investors or the general public who wish to access the information can do it through the SEC website from all over the world, without registration and for free.

However, there are certain securities that do not have any obligation to register because they are exempted by the Act, provided that certain special aspects are met. Some of these securities are all those issues that are offered privately only to a limited number of investors; issues that have a relatively low volume compared to similar issues; interstate offerings that can only be bought in the state in which they were issued\textsuperscript{196}; as well as issuances of federal, state and local governments. Usually, the aim of these exemptions on certain offerings which have a reduced volume is no other than trying to encourage, wherever possible, the capital formation and a lower financing cost of small and medium size companies.

As mentioned above, the Securities Act of 1933 determines that all those issues of securities intended to be bought and sold publicly must register, with some exceptions of certain issues which are exempt from such registration. These exemptions are included in the following table.

\begin{table}
\centering
\begin{tabular}{|l|l|l|}
\hline
\textbf{Securities Act of 1933} & \textbf{Offerings exempted from registration} \\
\hline
Private offerings to a limited number of persons or institutions & Offerings of limited size & Intrastate offerings & Securities of municipal, state, and federal governments \\
\hline
\end{tabular}
\caption{Table 10: Securities Act of 1933 Offerings exempted from registration}
\end{table}

\textbf{Source: Compiled by author based on Securities Act of 1933}

\textsuperscript{195} If you want to access to any information of a particular company registered with the SEC, please visit the EDGAR database at the following link: http://www.sec.gov/edgar.shtml#V1xZif50zoo

\textsuperscript{196} In this case, the exemption from registration is based on the fact that those securities are not sold in several states, so they are not under the jurisdiction of the SEC. In general terms, and as a consequence of not having to deal with an expensive registration process, these emissions are often cheaper than the normal ones, although in order to be carried out, they must meet certain additional requirements such as the requirement that the security can only be sold to individuals based in the state in which it was offered; that the company issuing the security must be registered in the state in which the offering takes place; and that the company must have a minimum level of activity in the state in which the securities are offered.
Also, the Act requires that a complete brochure containing the main features and risks of the offering must be distributed among investors. This process, is not only laborious, but also has some pretty high costs because of the legal advisory and human capital needed, costs that in many occasions certain hedge funds in the initial stages of their lives do not have enough capacity to face. In this regard, it must be noted that hedge funds try to avoid at all costs the expensive registration process by structuring their offerings as private offerings of securities directed solely to a limited number of professional and high net worth investors because, as seen before, these offerings are exempted from such registration if they comply with certain prerequisites, which are included in the "Regulation D"\textsuperscript{197}. Also, all those hedge funds that choose to carry out a private offering of securities exempted from registration, which must meet the requirements analyzed in detail below, must fill the corresponding "Form D"\textsuperscript{198}, and register it with the SEC to report that the placement will be held under the aforementioned "Regulation D".

The following table shows a brief summary of the requirements included in the Regulation D that must be met by private offerings of securities in order to be exempted from registration with the SEC.

\begin{table}[h]
\centering
\begin{tabular}{|l|c|c|}
\hline
& Rule 504 & Rule 505 & Rule 506 \\
\hline
Maximum Offering & $1 million over 12 month period & $5 million over 12 month period & No limit on amount \\
\hline
Number of purchasers & No limit & Unlimited accredited investors; 35 unaccredited investors & Unlimited accredited investors; 35 unaccredited, but sophisticated investors \\
\hline
Resale & Freely transferable (but must comply with state law requirements) & Resale limitation & Resale limitation \\
\hline
Mandatory information & None & Information must be disclosed to non-accredited investors & Information must be disclosed to non-accredited investors. \\
\hline
Manner of offering & General offering and solicitations are permitted under Rule 504 as long as they are restricted to accredited investors & No general solicitation & No general solicitation \\
\hline
\end{tabular}
\caption{Regulation D Requirements of private offerings to be exempted from registration}
\end{table}

\textsuperscript{197} You can access to the latest version of Regulation D for free through the website of the "Electronic Code of Federal Regulations", controlled by the Government of the United States, at the following link: http://www.ecfr.gov/cgi-bin/text-idx?SID=465dc4251925603a672a767b7916fc49&node=s17.3.230_1498.sg11&rgn=div7

\textsuperscript{198} This form is available in digital format on the website of the SEC through the following link: http://www.sec.gov/about/forms/formd.pdf
The first requirement to be met by a private offering of securities to be exempt from registration is the fact that it must be targeted exclusively to a limited number of accredited investors (with a maximum of 35), which are defined as all investors who, in general terms, are institutional or individuals with a net worth of more than $1 million, or an annual income of more than $200,000; or sophisticated, defined as those who, without having a high enough net worth to be considered as accredited investors, have sufficient financial knowledge to understand in a precise manner the characteristics and risks associated with the securities offered. However, it must be said that the vast majority of these offerings are directed exclusively to accredited investors, since if sophisticated investors are included, it would force the fund to distribute to all potential investors a detailed prospectus containing the main characteristics of the issue, which is highly laborious and expensive. Regarding this issue, it needs to be clear that must be the hedge fund itself the one that needs to carry out the process to determine if the potential investors are institutional, accredited or sophisticated. This process is performed by a relatively straightforward and simple questionnaire where investors must indicate that they are accredited investors but, however, the fund does not have to verify whether the financial data provided by potential investors are true or not.

Another important requirement to be satisfied by a private offering in order to be exempted from registration is the fact that the issue cannot be advertised in any traditional advertising way media conceived for the general public. In fact, not only the publication of the offering in newspapers, radio or television, among others, in order to reach investors is not allowed, but also the use of mass emails, web sites broadcasting information that might be accessed by the general public free of charge, as well as trying to influence potential investors in events and conferences to which they have been invited by using some of the methods listed above.

However, all the above aspects do not apply in cases in which a prior and important relationship between the issuer or/and any of the brokers responsible for the distribution of the securities issued, and potential investors, existed. In addition, the existing limitation that applies to the distribution of hedge funds over the internet is usually avoided by using a web page that require a necessary password, previously provided to these investors by the fund itself or even by some of its brokers, in order to access to the relevant information of the offering.

The last, but not least, of the main fundamental requirements to be met by a private placement directed to accredited investors is none other than the fact that the issuer must be responsible for ensuring that such investors, once they have received the securities, don’t engage in the activity of distributing the securities received to the general public. This is particularly important because if it’s not met, it will endanger the initial placement even if that placement fulfilled at the beginning all the requirements needed to avoid registration.
However, it must be said that the issuer can avoid problems that may arise if any of the investors decides to sell his interest to others just by registering with the SEC a complete questionnaire in which the fund demonstrates that it took all necessary inquiries to ensure that investors bought the securities offered exclusively for themselves, as well as by the introduction of a clause determining that those securities cannot be sold to the general public unless they are registered previously with the SEC. In the case of hedge funds, this type of problem rarely often happen mainly because it is usually common that the general partner of the fund include a clause which prevents selling units without the writing consent of the fund, along with the fact that, generally, the shares of a hedge fund usually have low liquidity compared to other financial instruments that are more attractive to many investors.

Along with the analyzed above "Regulation D", which applies to those private placements directed to accredited investors based in the US, hedge funds often use, in order to be more efficient, another important law for their interests that include certain exemptions from registration of private placements that, in this case, are carried out among investors who are based outside the US borders. This law is none other than the "Regulation S"199, which applies to offerings that took place outside the United States of both domestic and foreign issuers, and which dictates that some of these offerings, if they meet certain important requirements, are not required to register with the SEC.

The first requirement to be met by a private placement conducted abroad in order to be exempted from registration is the fact that both the placement and the sale must take place outside the country's borders, and the securities must be placed only among non US investors. In other words, the issuer must ensure that the purchaser is based outside the borders of the United States at the time of purchase, in the same way that the transaction should take place in certain markets previously defined by the SEC200. In addition, the transaction cannot be previously agreed with an investor of the United States. However, it must be said that the restriction that applies to the securities placed privately between non US investors among US investors is only temporary.

The second requirement refers to the fact that the issuer, or any of its affiliates, brokers or any other person acting on its behalf, shall not perform, in any way, what is known as direct sales efforts conducted within US borders that, in other words, refer to the fact that they must not perform activities whose main objective is to condition the US market to buy any of the securities being offered. Among these prohibited activities are to develop any type of publication referred to the offering with the aim of being distributed in the United States, even if that was distributed during the year preceding the placement, and has a minimum of 15,000 copies.

199 You can access to an online version of the "Regulation S" through the website of the SEC at the following link: [http://www.sec.gov/rules/final/33-7505.htm](http://www.sec.gov/rules/final/33-7505.htm)

200 The complete list of offshore markets where such placements can be made is available on the website of the SEC at the following link: [http://www.sec.gov/rules/final/33-7505a.htm](http://www.sec.gov/rules/final/33-7505a.htm)
However, there are certain exceptions that are not understood as direct sales efforts such as carrying out activities that are aimed at individuals who are not considered to be based in the United States; advertisements that are mandatory by law; or even a brief publication of the offering in a general newspaper with less than 20% of its total sales in the United States, but as long as the fund reports clearly that these securities offered are not registered with the SEC.

2. Securities Exchange Act of 1934

The second of the major laws affecting the operations carried out by hedge funds in the United States is the Securities Exchange Act of 1934\textsuperscript{201}. In this law, the Congress of the United States created the SEC in order to monitor and oversee the markets and the firms that are in any business related to financial markets within the country. The firms regulated and supervised by the SEC are shown in the following table.

\begin{table}[h]
\centering
\begin{tabular}{|c|c|c|c|}
\hline
\textbf{Firms regulated and supervised by the SEC} & \\
\hline
\textbf{Brokerage firms} & \textbf{Transfer agents} & \textbf{Clearing agencies} & \textbf{Self regulatory organizations (securities exchanges, FINRA)} \\
\hline
\end{tabular}
\caption{Firms regulated and supervised by the SEC}
\end{table}

\textit{Source: Compiled by author based on Securities Exchange Act of 1934}

In addition, the law gives the SEC authority over all aspects relating to the industry of national securities that, at that time, began to become the largest in the world in terms of importance, as well as in terms of volume.

Among the different powers that were granted to the SEC by the Act are the ability to force to the vast majority of firms that operate in the national securities industry to register with the Commission in order to regulate and supervise all of them, in an accurate and effective way; as well as to be in charge of conducting the supervision of all the self-regulated organizations, among which there are the securities exchanges, being the most important ones the New York Stock Exchange (NYSE) and the NASDAQ, and even the former NASD, nowadays known as the FINRA.

\textsuperscript{201} You can access to the online version of this law through the website of the SEC at the following link: https://www.sec.gov/about/laws/sea34.pdf
In addition, the law also identifies and prohibits certain unethical and harmful behaviors that may jeopardize the relationship of trust and cordiality between investors and firms operating in the securities markets. In order to fight this, the SEC has certain powers that allow the Commission to take action against all those market members who conducted behaviors that are considered as prohibited by law. Along with this, the SEC may also require, when deemed appropriate, any report on a regular basis, such as annual or quarterly reports, to all those companies whose securities are publicly traded, so that reports may be available to any individual who wants them for free and as soon as possible. As a result, those individuals will have access to information, that in most cases will be as accurate as possible, that will allow them to undertake investment decisions based, in the majority of cases, in true facts.

One of the key aspects included in the Securities Exchange Act of 1934 is to force all companies with more than $10 million of equity, and whose shares are held by a certain minimum number of investors, namely 500 participants\(^2\), to submit certain reports periodically to the general public, as well as any relevant corporate information about the company, that can be accessed through the EDGAR database made available by the SEC. As discussed previously, the most important reports are the quarterly and annual reports, in which the financial position of the company is reflected at the end of a given period, and that must be written and audited by an independent auditor.

Another important aspect that any company has to report is all the information and documentation relating to the materials used to ask its shareholders’ votes in order to approve or reject certain proposals discussed at the shareholders meetings, either annual or special. All this information must be filed with the SEC in time, so the shareholders can have access to the information before any request to meet the requirements of the legislation, in the same way that all the important facts related to petitions or requests in which the company is requesting its shareholders’ votes must be detailed in a precise way.

Along with all the above aspects, it is also required by the SEC the registration and the distribution to the general public of any information concerning a takeover bid that may affect a particular company, whenever an individual, either natural or legal person, intends to acquire at least 5\(^2\)\(^3\) of a publicly listed company. As in the previous cases, the SEC requires the registration of any relevant information on this type of corporate events, so shareholders of the company, either actual or potential, can have access to

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\(^2\) The SEC defines a maximum number of participants (500) of a hedge fund in order to be exempted from registration, if some other features required by law are met. This is quite common in a number of funds that are in early stages of their life, but not in the major existing hedge funds globally due to the high volume of assets under management and investors that have the vast majority of all of them, well above the minimum threshold.

\(^3\) Typically require 5% and no less because this is often understood as a considerable effort by the buyer to obtain significant control of the target company.
sufficient relevant and accurate information to assess the impact of such corporate action for their interests.

On the other hand, the SEC also prohibits certain unethical or fraudulent behaviors in relation to the offering, or any other activity, related to the sale of listed securities. Among these prohibitions, it is particularly important the one that applies to take positions in certain securities using privileged or confidential information. In this case and if some information has a confidential nature and has not been disclosed to other market participants, the holders of the information are not allowed to operate based on the information in order to prevent them to operate on favorable terms with respect to other members of the market, so they should refrain from using that information and keep it for themselves.

Moreover, some hedge funds are required to register with the SEC as dealers, defined as any person whose usual business activity is related to securities trading on its own, as well as in others name, something that has been historically differentiated of what the Commission means by trader, referring to those individuals who buy and sell securities, but not as part of their normal business. This distinction is particularly relevant among other things because, usually, traders do not have to register with the SEC, so many hedge funds take advantage of it in order to save the laborious and costly registration process, for which the only thing they need to do is to take positions exclusively on their behalf and not accepting or executing orders received from investors, as well as not receiving any compensation for buying and selling securities on behalf of any investor.

Another aspect to consider is the fact that those hedge funds that manage a volume of over 100 million, as well as banks, insurers or traditional asset managers, are obliged to submit on a quarterly basis the long positions maintained in their portfolio on the appropriate Form 13F. This form must be completed within 45 days of the end of the quarter and, in many cases, is used by a large number of investors from around the world when making investment decisions based largely on the long positions reported by the major funds in the world.

However, it must be said that the positions reported by hedge funds or by any other company managing more than a 100 million dollars, are not controlled by the SEC, so they may include mistakes, inaccuracies or even false information, although this, fortunately, is not usual. Furthermore, on the one hand, there is no obligation to submit the short positions of the fund, which in some cases are an important part of the strategy implemented, so it is virtually impossible, unless the individual is an investor of the fund, to know the way the funds are hedging their long positions and even their bearish bets. On the other hand and, as a result that the SEC registration of the long positions of funds needs to be done at the end of the quarter and on aggregate terms, it is possible that certain positions are no longer in the portfolio, so the investors need to analyze the
previous 13F forms to see which positions taken by the hedge fund increased or decreased during the period.

The last of the important aspects contained in the Securities Exchange Act of 1934 that have a direct impact on the activities of hedge funds operating in the United States is related to the legislation of how funds pay their broker-dealers for the many different services that they provide them.

There are two ways employed by broker-dealers when charging for their services. On the one hand, they can charge commissions and fees agreed in advance according to the traditional method or, in other words, hedge funds are the ones that, once they are serviced by the relevant broker-dealer, make a given payment. That is, the broker-dealer charge each service provided in an independent manner. However, this does not always happen, as certain services provided by broker-dealers, such as those relating to securities analysis, valuations or research, are included in the commissions that hedge funds pay when buying and selling securities and, therefore, are the fund's investors the ones that face those costs. This aspect has been understood by many investors as enormously detrimental to their interests, because they do not understand why they should be the ones who have to deal with the costs of certain essential services needed by the funds to carry out their operations and not the fund itself.

Furthermore, the use of these practices can lead to the rise of certain conflicts of interest, such as the fact that a given fund may gain access to services that are not employed in the investment process but yet being charged to investors; that a fund may perform the transaction with a specific broker for the simple reason that it is charging the lowest fee, regardless of the price offered, thereby violating the best execution policy; as well as due to the difficulty that exists when allocating among all the strategies implemented by the fund all the research costs that have been included in the fees, so a given investor of a multi-strategy fund might be invested exclusively in one of the vehicles of the fund that carry out a strategy for which it is not necessary any external analysis but, however, might be paying for this analysis. All this has led, in recent years, to a decline in this form of payment accepted years before by certain hedge funds in order to avoid the discontent of investors and potential cash outflows but, nevertheless, all funds that, due to their size and characteristics, are exempt from registration, as well as many others, are still implementing these practices in order to get the benefits attached to them.

However, and as a result of potential conflicts of interest that may arise from the use of the aforementioned practices, the Securities Exchange Act of 1934 determines a number of cases in which such practices are permitted, but only if certain circumstances are met.

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204 This problem is quite common in those funds that implement quantitative strategies, which usually are based on algorithms and mathematical models that have been developed by the fund.
The first condition that must be met refers that the expenses contained in the commission paid by the fund must be associated with all the research and brokerage services that are eligible. Within the research services, the eligible services are those such as access to reports, advice, databases, events or proprietary software made available to the fund by the broker, among others, while in the case of brokerage services will be eligible all those such as pricing of securities, access to bid ask screens, communication services and, ultimately, all computer and electronic services made available to the fund to enable it to run any kind of order.

On the other hand, it is also important that the services included in the fees must allow the manager to make investment decisions in a more successful way or, in other words, those services must be essential in order to help him to meet his responsibilities in the best way. In addition, the fund is required to determine whether the costs of a particular service are consistent with the service received in order to prevent frauds, or not.

3. Trust Indenture Act of 1939

Another law affecting the activities carried out by certain hedge funds is the Trust Indenture Act 1939. This law, which active to fixed income securities, such as bonds, notes or letters, among others, was created to protect all investors of bonds for those cases in which a particular entity is unable to face its contractual obligations. To do this, the law requires the appointment of a trustee who will have the power to confiscate the assets of the company which carried out the bond issue and to sell them to recover, if not all, at least part of the investments made by bondholders and thereby protect their rights and interests. Also and, whether such securities are registered with the SEC or not, a bond issue with a volume of more than $5 million cannot be offered to the general public without a written agreement in which both parties, the company and the bondholder, have given their consent by signature, and in which the main characteristics of the issue are detailed.

4. Investment Company Act of 1940

The Investment Company Act of 1940 is one of the most important laws to consider when analyzing the existing US legislation aimed at regulating the activities of hedge funds. In this regard, this law regulates all those companies that are considered investment companies, which are defined as those whose principal and recurrent activity is related to investments, reinvestments and securities trading, and whose securities are

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205 Along with all those research services that, according to the Securities Exchange Act of 1934, have an eligible character, the Act includes also a number of services that must not be included in order to avoid abuses that have occurred in certain situations. Examples include invitations to events, meals, entertainment and even leisure activities, among others.

206 You can access to an online version of the law on the website of the SEC at the following link: https://www.sec.gov/about/laws/tia39.pdf

207 An online version of the law is available on the website of the SEC at the following link: https://www.sec.gov/about/laws/ica40.pdf
publicly offered to a large number of investors. Therefore, the law regulates and defines the responsibilities, roles and limitations of companies such as asset managers, mutual funds, hedge funds, private equity funds and even holding companies, among others, that offer investment products to the public.

In general terms, the law seeks to end, or at least to greatly minimize, with potential conflicts of interest that may arise in certain transactions given their complexity and, ultimately, to promote funds to act always in the best way for their investors’ interests.

The first obligation required by the law is that companies have to disclose their financial statements to the public both in the corresponding initial public offering, as well as on a regular basis once the securities have been admitted to trading. In addition, they must make available to the public all relevant information about their strategies, including their investment objectives, the risks involved, as well as about issues relating to the organizational structure and the operations carried out by the company. All this is aimed at that investors may have sufficient information to carry out investments in the best way but, as mentioned before, the SEC does not supervise or investigate whether the information provided by companies in the registry is true or not, so must be investors themselves the ones that need to determine if the information submitted by a given firm has been misleading, fraudulent or unreal. In these cases, they are entitled to exercise appropriate legal actions to protect their rights. Also, it should be clear that the Investment company Act does not allow the SEC to monitor in a direct way the decisions or activities conducted by this type of investment firms, as well as judging the investments made by them.

Along with all the above, the law also describe the main functions, activities, size, and even structure, of companies affected by its regulation; determine various exemptions, in which tend to frame certain hedge funds; define the requirements needed when recording the activities carried out by such firms, as well as the accounting practices; require that the companies must have a board of directors in which at least three quarters of the directors must be independent; determine how can be distributed mutual funds, as well as how must be regulated subscriptions and redemptions; determine that funds have to maintain a certain percentage of assets in cash in order to cope with the demands of investors who decide to sell their interests; define the way in which investment companies that decide to change policies when carrying out investments have to do it and report it to investors; and determine certain limitations when carrying out some strategies that tend to affect short selling and leverage, among other things.

208 In many cases it is said that the SEC conducts a passive and not proactive monitoring, because it only acts against those firms that have carried out fraudulent behavior once these behaviors have been reported and made available to the Commission by the investors affected.
In addition, it must be noted also that there are certain situations, if some aspects are met, that allow an issuer to be exempted from registration with the SEC, which are often exploited by some hedge funds, particularly the smaller ones, that try to avoid having to deal with the complicated, laborious and costly registration process.

The first of these conditions that allow an issuer not to register with the SEC requires that the issuer's shares must be held by a maximum of 100 investors based in the United States, and provided that the issuer has not carried out a publicly placement. Moreover, the condition won’t be achieved if certain fund managers decide to create several additional independent funds aimed to conduct a similar strategy, since all of them will be considered as one part of a whole. However, this can be avoided if the strategies implemented by each of these separate funds are different, although it is not usually common.

Just as in the previous cases, the Act allow certain funds of being exempt from SEC registration if the shares of the fund are exclusively held by the so-called qualified buyers, also known as super-accredited investors. In this regard, an investor will be credited as super-accredited if it has a net worth of at least $5 million; if it owns a family business that has investments of at least $5 million; if it is part of a trust in which all of its members are qualified buyers, and provided that has not been formed solely to purchase the shares of the fund offered; as well as any individual who manage at least $25 million of assets, regardless if those assets are his personal assets or belong to qualified buyers. Also, there is no restriction in the maximum number of qualified investors accepted, although certain hedge funds, many of which are small and medium size, usually keep the number of participants below 500 to avoid having to register.

5. Investment Advisers Act of 1940

Another major piece of existing legislation currently affecting operations carried out by hedge funds in the United States is the Investment Advisers Act of 1940. This law has a very similar structure of the one discussed above, but in this case it is aimed at regulating the responsibilities and the role of investment advisers.

In general terms, with very few exceptions, the law stipulates that all companies, or individuals, who obtain any compensation for investment advice should register with the SEC and comply with all the obligations in order to protect the interests of investors. This registration is done through the Form ADV, which is composed of two parts. The first of them includes relevant information about the adviser; its clients and employees; possible events that ended in some kind of penalty or disciplinary record to

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209 An updated digital version of the law can be found on the SEC website at the following link: https://www.sec.gov/about/laws/iaa40.pdf
210 Available online at the following link: http://www.sec.gov/about/forms/formadv.pdf
the adviser or any of its employees; the practices carried out when developing the business; as well as the affiliations of the adviser with other firms, among others. In the second part, the adviser must include several brochures, written in a simple and easy to understand language for the vast majority of investors, in which the various services provided to clients are detailed; as well as potential conflicts of interest that may arise between the two parties; the fee structure applied to each of the services provided; and relevant information about the managers of the firm, such their career path or studies, among others. All these forms are available to the public for free at the SEC website\textsuperscript{211}.

In addition, investment advisers are required to distribute among their clients every year an updated brochure, including a brief commentary about the major changes that have been introduced in it; to adopt a code of ethics; to keep records of all operations and actions carried out with the money of their clients; as well as to perform an accurate regulatory compliance, among other aspects. Along with this, investment advisers must also have an appropriate compliance manual, equivalent to the investment policy statement of any other fund, including aspects such as the implemented strategy, detailed marketing activities, operations, and even aspects of the policies and procedures concerning voting issues, among others.

All the documentation required must be protected and saved\textsuperscript{212}, preferably in physical form, usually for a period of two years, although some documents must be preserved for a longer period of time, and must be available at all times if it’s required by the SEC when necessary. Also, all investment advisers that are registered with the SEC are subject to being regularly visited by Commission inspectors in order to carry out further inspection to detect possible frauds, unethical behaviors or deficiencies, being these ones very usual, conducted by the advisor when meeting the requirements required by law, which shall be corrected as soon as possible.

Moreover, and as usual, there are certain exemptions that may be used by some hedge funds, if certain conditions are met, that allow some investment advisers not to register with the SEC. Some of these exemptions are that the investment adviser must have no more than 15 clients; that the adviser do not provide any financial advisory services to any investment services company that have the obligation to be registered with the SEC; and that does not advertise itself to the public as an investment adviser. Furthermore, and along with the above, any investment advisor that manages a volume of assets of less than $25 million do not have the obligation to register with the SEC.

\textsuperscript{211} All kind of information about investment advisers registered in the SEC is available through the following link:
http://www.adviserinfo.sec.gov/IAPD/Content/IapdMain/iapd_SiteMap.aspx

\textsuperscript{212} At present, this information may be digitally stored, provided there is a backup of the files.
Finally, an important aspect to consider is also the fact that the Act may also require those investment advisers providing services outside the United States having to register with the SEC. In these cases and, provided they have the obligation of being registered with the SEC, they will be subject to existing legislation in the United States and, therefore, must comply with it.


As mentioned before, all the activities of hedge funds operating in the United States are usually supervised by the SEC, as well as by the "Commodity Futures Trading Commission CFTC", in those situations where the strategies implemented by some hedge funds involve the use of financial futures contracts on commodities. In this regard, all those hedge fund managers operating with commodity futures are defined as "Commodity Pool Operators CPO", while anyone who advise on these products will be defined as a "Commodity Trading Adviser CTA". This aspect is relevant, because the Commodity Exchange Act of 1974 requires that both CPO and CTA have to register with the CFTC, something that is time consuming as well as expensive. Furthermore, and along with the registration, the law requires compliance with certain aspects such as carrying out ethical practices, to report the operations performed in a clear and precise manner, as well as to keep a record of all activities carried out, among others.

The main differences between a CTA and a CPO are shown in the following chart.

![Table 13: Main differences between a CTA and a CPO](http://www.cftc.gov/files/ogc/comex060601.pdf)

Source: Compiled by author based on information from the Managed Funds Association (MFA).

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213 You can access to a digital version of the law, in which the amendments carried out in recent years are included, through the website of the CFTC at the following link:

Also and, just as it happens with investment advisers, the CFTC determines that both CPO and CTA must distribute to potential investors a prospectus containing some important aspects, such as the future contracts in which positions are taken; the strategy implemented; operational risks; fees charged to investors; as well as to provide a statement of the fund's positions updated on a quarterly and on an annual basis to investors, and one annual report to the CFTC. In this report, different metrics must be included such as the performance to date since inception of the fund; the annualized return; monthly returns; and the worst peak to valley drawdown in the last five years, all presented on a net basis or, in other words, after deducting all the commissions and fees charged to investors by the CPO or CTA.

However, and as in the case of the previously analyzed laws, some CPO or CTA will be exempted of registration with the CFTC if they met certain conditions, among which are having less than 15 investors or assets under management up to $200,000; that only family members of the manager can access to the fund; and that the portfolio manager does not receive any compensation for managing the assets, provided that he/she is not required to register due to other activities carried out, among others.


Introduced under President Bill Clinton, the National Securities Markets Improvement Act of 1996214, also known as NSMIA, had as main objectives to make US securities markets more efficient; to improve and promote capital formation throughout the nation; to promote and boost greater efficiency in the business of managing investment funds, thereby protecting the interests of investors in a more precise way; as well as to make the existing regulation more efficient at both the state level and at the federal level. This last aspect, was achieved with the introduction of various laws at the federal level aimed to eliminate rules and regulations imposed by each state individually, helping thus achieving greater efficiency.

In general terms, through the elimination of certain clauses contained in some laws, and defined apparently in an arbitrary manner, which were perceived as negative by a great number of participants of the industry, the National Securities Markets Improvement Act boosted the growth of the hedge fund industry, which grew not only in number of funds, but as well as in attractive, as demonstrated by the increase in the number of new investors in this type of investment vehicles. In addition, it also allowed to increase the number of funds and investors exempted from registration, which helped, to some extent, to prevent capital outflows to countries having a more loose regulation affecting the industry.

214 Available online at the following link: http://www.gpo.gov/fdsys/pkg/PLAW-104publ290/pdf/PLAW-104publ290.pdf
8. Sarbanes-Oxley Act of 2002

Launched in 2002 by the government of George Bush, the Sarbanes-Oxley Act, also known as SOX, and that took its name of its main architects, Paul Sarbanes and Michael Oxley, is considered one of the most important regulations of the financial industry introduced after several scandals affecting certain firms which, until then, enjoyed a strong reputation, as well as a notorious prestige at both national and international level.

The main objectives of the Act, which will be analyzed in depth subsequently, are included in the following table.

Table 14: Main objectives of the Sarbanes-Oxley Act

<table>
<thead>
<tr>
<th>Sarbanes-Oxley Act of 2002</th>
<th>Main objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>To enhance corporate responsibility</td>
<td>To enhance financial disclosures</td>
</tr>
<tr>
<td>Creation of the Public Company Accounting Oversight Board (PCAOB) to oversee the activities of auditors.</td>
<td></td>
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</tbody>
</table>

Source: Compiled by author based on Sarbanes-Oxley Act of 2002

Its main purpose was to protect the interests of investors in all cases of accounting frauds carried out by companies, for which various mechanisms and procedures were established as mandatory in order to improve the way in which companies reported any relevant financial information and, thus, to prevent and to avoid, to some extent, the falsification of financial statements by companies as well as accounting frauds. Among the various aspects covered by the law are issues such as transparency, responsibilities of top management teams of companies, ethical behavior, as well as aspects related to some limitations applicable to independent auditors.

The first important aspect covered by the Act refers to the obligation of all the managers of the companies, defined as those individuals responsible for administering the firm, to certify the accuracy of the information provided and included in the annual reports made available both to the SEC and the general public. In this regard, they must

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215 Among the companies involved in these scandals were Enron, Tyco and WorldCom, among others. The most notorious one was the Enron scandal that ended with the demise of company, since it was discovered that its executives were reporting strong profits that came from businesses conducted with subsidiaries of the company in order to hide the huge losses that had the firm years before.  

216 A full version of the law, as well as related information on the various amendments introduced in recent years, is available on the website of the SEC through the following link: [http://www.sec.gov/spotlight/sarbanes-oxley.htm](http://www.sec.gov/spotlight/sarbanes-oxley.htm)
certify not only the accuracy of the financial statements presented, but also that they carried out within the company all those necessary control mechanisms and procedures aimed to avoid activities that can be considered as fraudulent. Along with this, the independent auditor must also issue an opinion on whether the managers carry out such internal control mechanisms in an effective manner or not, and that must be independent of the opinion that the auditor has of the individual financial statements submitted by the company.

All the aspects mentioned above are critical, because in the event that the information contained in the annual or quarterly report of a certain company does not reflect the real situation on an accurate way, the administrators, generally understood as the Chief Executive Officer (CEO) and the Chief Financial Officer (CFO), will face fines of up to 5 million and imprisonment of up to 20 years. In addition, anyone who concealed, destroyed, and even altered, relevant financial information about the company and that, ultimately, helped it to commit any fraudulent activity, will face similar fines and imprisonment, in the same way that the SEC is empowered to prevent the collection of certain bonuses by those executives who have conducted unethical behaviors, although these cases are relatively rare\(^{217}\).

Furthermore, it is noteworthy that the implementation of effective internal control mechanisms aimed to prevent possible fraudulent activity is generally very expensive, so it should be analyzed in detail by all those companies considering going public. This aspect has been criticized by many public companies that have a relatively small size, because they have seen, since the introduction of the law, how costs to meet the obligations introduced by it rose to very high levels. This has forced the PCAOB\(^{218}\), a private non-profit organization created by the Sarbanes-Oxley Act intended to oversee the audits of public companies in order to protect the interests of investors, to start different programs directed to small and medium-sized public companies aimed to help them to establish control mechanisms according to their size and complexity in order to save costs.

Finally, another important aspect contained in the law refers to the off balance sheet items, defined as transactions in which the company does not have any legal claim or any responsibility for, but which, however, pose certain risks to the company. Within these complex operations are included leases or securitizations of certain assets, among others, which are particularly relevant when determining the financial health of the firm but, nevertheless, that are quite difficult to trace because, as indicated by its name, are assets or liabilities not included in the balance sheet of the company. In this regard, the law requires companies to report all their off balance sheet items as long as these items


\(^{218}\) For more information about the Public Company Accounting Oversight Board, it is recommended to visit its own website through the following link: [http://pcaobus.org/Pages/default.aspx](http://pcaobus.org/Pages/default.aspx)
are relevant to understand in the most accurate way the financial position of the company.

9. Dodd-Frank Act of 2010

The international financial crisis that began in 2007 and that, even today, continues to adversely affect a large number of economies from around the world, many of them located in Europe, had a huge impact on the US economy, as demonstrated by the severe recession suffered that, fortunately, seems to be part of the past. This crisis, which is ascribed by many economists to the financial sector, brought a huge battery of measures that were introduced by the Obama administration in order to prevent and minimize, as far as possible, the chances that a similar situation will happen again in the next few years. Among these measures, was the so called Wall Street Reform and Consumer Protection Dodd-Frank Act introduced in 2010, which takes its name from its principal architects Christopher Dodd and Barney Frank.

This Act\(^{219}\), introduces a great number of provisions\(^{220}\) that are expected to be implemented over the coming years and whose main objective is to reduce certain risks of the US financial system. Also, it created several government agencies designed to monitor and oversee some of the aspects included in the law, which will be analyzed in detail below. The following table shows the different government agencies created by the Dodd-Frank Act.

\begin{center}
\begin{tabular}{|c|c|c|}
\hline
Financial Stability Oversight Council (FSOC) & Orderly Liquidation Authority (OLA) & Orderly Liquidation Fund (OLF) \\
\hline
Dodd-Frank Act of 2010 Agencies created

\end{tabular}
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\begin{center}
\begin{tabular}{|c|c|c|}
\hline
Federal Insurance Office (FIO) & Consumer Financial Protection Bureau (CFPB) & Office of Credit Ratings (OCR) \\
\hline

\end{tabular}
\end{center}

\textit{Source: Compiled by author based on Dodd-Frank Act of 2010}

\(^{219}\) You can access to a digital version of this large and complex law in the SEC’s website at the following link: [https://www.sec.gov/about/laws/wallstreetreform-cpa.pdf](https://www.sec.gov/about/laws/wallstreetreform-cpa.pdf)

\(^{220}\) For an exhaustive list of the various provisions that, so far, have been introduced, as well as information on the actions being carried out in order to introduce the remaining provisions contained in the law, it is recommended to visit the SEC’s website at the following link: [http://www.sec.gov/spotlight/dodd-frank.shtml](http://www.sec.gov/spotlight/dodd-frank.shtml)
The first of these agencies are the Financial Stability Oversight Council (FSOC) and the Orderly Liquidation Authority (OLA), designed to monitor, supervise and oversee all those companies considered “too big to fail” or, in other words, that pose a systemic risk, in order to prevent the collapse of one of them that could jeopardize the financial stability and that may endanger the US economy. For proper development of this task, the Act also created the Orderly Liquidation Fund, aimed to provide funds to all those companies that have faced a process of bankruptcy as a result of financial weakness.

Along with the above, the Council also has authority to divide those banks which, due to their size, are large enough to cause a collapse of the economy in the event that problems that might endanger their future arise, as well as to restructure and liquidate any other company with financial problems, whether it pose systemic risk or not. In addition, the monitoring and controlling of all those companies of the insurance sector that can pose any systemic risk is conducted by the Federal Insurance Office, which has as main objective to prevent any problematic situation that may arise similar to those that took place during the financial crisis that begun in 2007, in which the biggest bailout of a private company in the history of the United States affected an insurer, AIG, which received around 182.3 billion of public funds.

Another agency created by the Dodd-Frank Act is the Consumer Financial Protection Bureau (CFPB), aimed, among other things, to prevent the so called predatory mortgage loans, which were considered as another of the main factors that led to the collapse of the world economy in 2007. In addition, another important objective of the office is to compel institutions to simplify the terms contained in the contracts of those mortgages to make them easier to be understood by customers. Along with this, it is also aimed to prevent banks, and even certain intermediaries, operating in the mortgage loans market to have perverse incentives, such as charging a higher fee when closing loans that have higher commissions or interest rates, or by directing customers to those loans that pose a higher cost, whether the loan is suited for the client's interests or not, which may lead to a similar situation to the one that took place years ago.

On the other hand, the Consumer Financial Protection Bureau is also responsible for managing aspects related to any complaints of clients who have suffered abusive or improper conducts by any lender when asked for a loan, either mortgage or consumption.

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221 For more information about this agency, it is recommended to visit its own website at the following link: http://www.treasury.gov/initiatives/fsoc/Pages/home.aspx
222 To delve more on this government agency, it is recommended to access its own website at the following link: http://www.consumerfinance.gov/
Along with the agencies analyzed before, the Dodd-Frank Act also introduced the Office of Credit Ratings (OCR)\textsuperscript{223}, aimed to prevent certain events that weren’t anticipated, intentionally or not, and detected by the main rating agencies of the country, which maintained high credit ratings to institutions and even to products (like CDO’s) that pose important problems until a few days before of the bankruptcies and defaults that followed soon after. In this regard, the Office of Credit Ratings oversees and monitors the rating agencies operating in the country to prevent that these agencies may provide inaccurate or misleading ratings due to the existence of potential conflicts of interest with any of their customers.

Some of the objectives of the office are to promote accuracy when giving ratings by rating agencies; to improve and monitor the procedures and methodologies used by each agency when giving a certain rating; to ensure that the rating agencies report their activities in a precise manner to all those that require it; as well as to prevent certain ratings that may be somewhat influenced by any conflict of interest. All of this was aimed to protect the interests of investors and, ultimately, to increase the efficiency of the US financial markets by making them more fair and secure.

Another of the most controversial aspects of the Dodd-Frank Act, which has been strongly criticized from various levels of the financial world, is known as the “Volcker Rule”, which takes its name from the former Federal Reserve Chairman Paul Volcker, who was responsible for the development and introduction of it. This rule arises because, in the words of Volcker himself, certain speculative activities carried out by a large number of financial institutions around the world were one of the main problems, among others, that eventually led to the international financial crisis that started in 2007. Therefore, it seemed essential to try to tackle this type of speculative activities to avoid similar situations. In this regard, the rule prohibits banks to carry out certain investments with their own treasury, in which were included investments in hedge funds or private equity funds, among others. In practical terms, the Volcker rule prohibits banks to engage in proprietary trading activities on any type of asset, as it believes that such activities not only do not benefit customers, but it also may endanger their interests.

As expected, the Volcker Rule has caused great changes in a large number of financial institutions that had proprietary trading desks conceived to take speculative positions with the bank’s own funds in order to obtain a profit. In this regard, these proprietary trading activities must disappear, so that banks will only be able to carry out activities considered as necessary in order to provide the services included in their prime brokerage business, such as market making; hedging of positions as requested by customers or aimed to cover possible risks that may arise within the firm due to the

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\textsuperscript{223} If you want to access to all the relevant information concerning the Office of Credit Ratings, please visit its own website at the following link: http://www.sec.gov/ocr#_VI81YP50zoo
normal development of its business activities; underwriting of issues; securities custody; or taking positions in debt instruments of governments to provide liquidity, among others. However, it should be clear that none of the above activities may be carried out by a bank if it can jeopardize the interests of its clients.

Clearly, the introduction of the Volcker rule has resulted in the disappearance of a large number of proprietary trading desks across the country, as many of the members of those desks have decided to leave the banks where they were working in order to create their own hedge funds or to join other existing funds. This had a positive impact on the hedge fund industry, as demonstrated by the growth experienced by the industry in recent years, but negative for all those banks that have suffered considerable loss of talent after seeing how many of their key employees decided to leave the institution.


The last of the major laws affecting all those hedge funds that conduct their operations in the United States is none other than the Jumpstart Our Business Startups Act, known as JOBS\textsuperscript{224}, introduced by the government of Barack Obama in 2012. As noted before, the Jumpstart Our Business Startups Act\textsuperscript{225} is aimed at helping start-ups and small and medium enterprises of the US to obtain financing in a much more efficient and less costly way, to thereby positively impact in job creation and in the economic activity. To achieve its objective, the Act introduced several reforms aimed at relaxing some of the strict obligations imposed by the SEC for those start-ups, or small and medium sized firms, that choose to obtain financing by accessing to capital markets, which obligates companies to register with the Commission, being this a very expensive and laborious process given the limited resources available to these companies.

Among the various provisions included in the law, it must be noted the impact that had on the hedge fund industry the lifting of the ban that had these investment vehicles to advertise in traditional media distributed to the general public. In this regard, and thereafter, hedge funds are allowed to advertise any type of private placement that they plan to carry out but, however, these securities only could be offered to accredited investors.

On the other hand, it must be understood that the lifting of the ban that prohibited hedge funds to advertise their activities in mainstream media is justified because, regardless of the fact that many hedge funds can’t be considered as small businesses due to the large volume of assets under management they have, it is true that many of them, in the

\textsuperscript{224} You can access to a digital version of the law through the following link: http://www.gpo.gov/fdsys/pkg/BILLS-112hr3606enr/pdf/BILLS-112hr3606enr.pdf

\textsuperscript{225} If you want to delve more into other aspects of this law, such as initiatives, amendments or reforms pending of introduction, please visit the website of the SEC at the following link: http://www.sec.gov/spotlight/jobs-act.shtml
search for absolute returns, carry out important investments in those start-up companies that present an attractive growth potential, so it can be said that hedge funds are one of the main sources of funding for many newly created businesses, provided that such businesses present attractive ideas and growth potential in the future.