



ICADE BUSSINES SCHOOL

INTERMARKET ANALYSIS
THE RELATIONSHIP BETWEEN FINANCIAL
ASSETS' PERFORMANCE AND ECONOMIC
CYCLE

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ABSTRACT

Financial markets are connected, and because of this, the different financial products have a relationship between them, but also they are influenced by the macroeconomic environment... How strong is this relationship? It is something to take into account when investing? Has this relation anything to do with the economic situation? In the following paper we analyze the different assets and try to find an answer for these questions.

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1. EXECUTIVE SUMMARY

The following document will be focused on the behavior of financial markets and its impact in the broader economy. The behavior of financial markets is an outcome of the collective behavior of a wider than ever number of agents, as a result of the use of new technologies and popularization of its use between professional and non-professional investors across the globe, and the influence of such technology into investment decisions and operations (e.g. electronic trading). We will assess how transformation seen in financial markets in the last years impacted real economy and the relation of the performance of the different type of assets with the different stages of the last economic cycle. The period covered will be from the years previous to the great depression until present days, comprising one of the most stimulating economic cycles in the last 100 years.

The Economy is a basic pillar for individuals, families, companies, governments. Is the largest assortment of connected production and consumption activities that help determining how, scarce resources are allocated. Most of the world economies' are market-based, which means that the different goods can freely (to a major or lessees extent) move in trough the market according to supply and demand.

During these most recent years, all the countries in the world are recovering from one of the worst financial and economic crisis since The Great Depression. This crisis has had a lot of consequences in the different levels of the society. There have been financial consequences, social consequences, and demographic consequences among others. This crisis has provoked changes in the way companies produce and sell their products to their clients.

Before the financial crisis started in 2007-2008 the economic, financial and social situation was very different from the one the world is living now. In relation to the economy, the countries were experiencing a stable and wealthy moment in which the sales of companies were high and continuously increasing, governments were healthy enough to increase the different budgets, and demand of goods and services was so high that companies needed to hire more people, what meant that unemployment rates were low. Society was wealthy, as wages were higher (so were prices), but they had more available money. Another important fact, was that in the different countries there was a stable political period what will change due to the financial, economic and social crisis. Financial markets were strong and stable which made that investors were confident enough to take risky positions and to introduce liquidity to the market. Another important variable of financial markets, which will be an important problem during the crisis, is the Real Estate market.

In some countries construction companies start building at a high speed which made that the supply of buildings was high, but people, as they were wealthy, decided to invest in real estate properties in order to get future cash flows. Most of these investors got those properties thanks to a mortgage, which in the future will cause more than one headache to the financial institutions.

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In September of 2008 one of the biggest investment banks of the world announces its bankruptcy: Lehman brothers closes its doors for good. Since 2007 there were some signals that showed that the stability in which the world had lived was one to be broken, but it wasn't until the bankruptcy of Lehman brothers when all the variables of the economy started to fall down causing one of the worst economic and financial crisis of the history. This crisis has caused changes in all levels of the economy and the society that will be visible in the recovery some years after. Since that moment stocks of all the world started to fall dramatically. This meant that investors were taking out the money of the markets, what will have consequences in terms of liquidity in the future. The economic crisis had serious consequences for the companies. These ones saw their sales decrease. The increase of supply and the decrease of demand generated that companies fired people, as they had to reduce cost because the income fell. This had consequences at a social level, by increasing highly the unemployment rates. Families started to have economic problems, and some of them stopped paying the mortgages which provoked that banks seem their credit defaults increase and that families lost their homes as banks took them because they didn't pay the mortgage. It is appreciated that when one part of the economy starts to show signs of sickness the rest of variables get contagion and a lot of consequences come with them. The political stability in some countries was threaten with the ascendant of the populisms and the origination of some political parties that support those ideas.

Focusing on financial markets, the low liquidity in the market, had an impact on consumers' behavior and also in investors' decisions. One of the worst effects provoked by crisis is the lack of confidence, which sometimes can threat a fast recovery and makes financial markets more volatile. All these consequences make the different type of financial markets behave in a certain way. Do investors put their money in different products depending on the economy evolution? When reading those questions the most logical and obvious answer is yes. But how strong is that change of positions? How does the investor change its portfolio? Where do they destiny their money if is not in the typical assets?

When the worst part of the depression ended, the economies and the society started to recover from the crisis. Nowadays, the recovery is still present on the different countries and some of the consequences of the crisis are still appreciated on the society such as the populisms, which have been mentioned before.

Thanks to the different economic and fiscal policies the markets have been able to survive and they are now recovering, as it is shown by the different indicators and variables.

Regarding the business world, the information provided by companies, agencies, central banks and other agents, indicates that most of the participants of the economy are showing positive trends in their results.

The different stock market such as the New York Stock Exchange (NYSE), the DAX, the IBEX 35...are seeing that their levels are reaching maximum points, what hasn't been seen in the last 10 years, where stock markets have fallen dramatically. Not only it's appreciated upward trends on the stock exchanges, but also in the different components of the economy, the different ratios and variables which are important in companies.

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An important indicator of the economy it's also the Real Estate market. It has been appreciated in the last 2 years that prices, which were at the bottom, are now growing back again.

Banks have started to lend money to individuals and also to other companies, and this is really important because it's a sign of recovery, because now people and companies are able to repay those debts (which in the past were a headache for both), which encourages banks to start moving again the money they have.

On the one hand we can see that, in the case of governments, the risk premium, which shows the capacity of a government to repay the money they owe are reaching minimum point in the vast majority of the countries.

On the other hand, we could think that during a recovery or expansion stage investors feel more confident and again change their positions in order to get more profitability. This would also be correct.

As it has been mentioned on the beginning of the summary, the decision of putting their money in one asset or in other it is influenced by the macroeconomic situation and the other way around. So taking into account these premises, the question to answer is where to invest.

Even though the economy and the society have both changed, there will always be economic cycles, so it is very important to know how assets behave in each period. New strategies for investing will be seen in the market in the near future. As time passes the IT companies are growing and it is surprising how this kind of companies are influenced by the macro environment. In this document we will be able to analyze the last decade in which this changes have been the main highlights.

In conclusion, in the last years we have seen how the society and the economy have changed due to the Great Depression. Investment decisions have varied, and thanks to the eruption of new economy, investors have changed their strategies.

The Crisis has now opened the door to never-seen-before economic trends, the so-called Fourth industrial revolution. The way of producing has changed from a massive production way to a more customized and client focus way. Collaborative Economy, Renewable energies, Artificial Intelligence, Big Data.... We are just starting to see a new Economy and maybe the "old" metrics used to measure the "old" economy are useless. Time will tell us if the Conclusions of this work will be valid in the near future or not; it will certainly be an interesting topic for a new End of Master Project...

2. WHY THIS TOPIC?

As I have specialized in the Branch of finance I want to study the impact of the changes in the macroeconomic cycle in the financial markets, and how these impacts make the decisions of investors change.

Whenever there is a political change in a country. Elections would be a good example of this. During election periods the markets tend to be more volatile, as, depending on the candidates and their proposals, investors and companies will take one decision or another. After the day of the elections, depending on the result, if it was as the markets expected, stocks tend to increase but will decrease if the result wasn't the one expected. Whenever a company releases their results, even if they are on profit, if the market expected more profits for this company, its quotation will go down. The point is, that is interesting how markets and investors react one way or another depending on the macroeconomic and social situation.

Moreover, as financial markets are influenced by the economic situation, it works the other way around too. Financial markets have a strong impact in the economy, not only the countries' economies but also in global economy. That's the reason why I want to analyze how economy behaves depending on the financial markets evolution, and in the end, the financial markets behavior and evolution depends on what people invest and how they do it.

I find the different financial markets really interesting and stimulating, as each of them, has its own characteristics and, when there is a change in the macroeconomic environment, one kind of market is affected in a positive way while the other one is affected in a negative way. I want to study this behavior in order to see the different reactions of the main assets to changes in the economic cycle.

With the development of this paper I will be able to get deeper into some important macroeconomic indicators, the evolution of financial markets, the impact in the behavior of the investors or financial behavior and to review the different type of financial assets.

3. METHODOLOGY

In order to reach the goal set up in the thesis we are going to follow a certain methodology.

First of all, to get the information some research will be done in order to look up for information, not only about the possible correlation between the different assets traded in the financial markets, but also to get some theoretical knowledge in order to understand and get to know the different concepts that are going to be presented in the following pages.

Secondly, theoretical definitions about what the economy is will be given and which is its cycle. About this last concept I will define in detail each stage of the economic cycle and we will see how the economy behaves in those phases in order to be able to link it with the investment decisions that investors and portfolio managers take. In other words we are going to define the different macroeconomic environments.

Thirdly, one of the most important and useful things to understand this thesis will be explained: the different financial markets. This will be split in equities markets, bonds or fixed income markets, currencies or FX markets, commodities markets and finally, but not less important, other kind of assets traded in the market that are important for investors in order to develop their portfolios and strategies (for example, put and call options or other kind of derivatives). They will be defined in detail with the objective of knowing the most important things about them to understand better the motivation of the financial agents of investing on them.

Finally, we will use the two previous steps to mix them and analyze where do people invest during the different stages of the economic cycle in order to know if there is a real correlation between the investments made and the phase in which the economy is in. The timeframe in which the analysis will be done will be from the last 15-10 years. The reason of choosing this time framework is because this will cover a stage of expansion, the crisis and the recovery in which the world is now.

In order to develop the analysis I will use not only theory but also some graphs to see the correlations and behavior of the different markets and its products. These graphs will give the reader a first visual view of how does the asset perform depending on the macroeconomic situation, which will be reflected by different variables such as the inflation, which is one of the leading indicators if you want to know in which period is the economy.

4. KEY WORDS AND DEFINITIONS

In order the reader to understand better the paper, in the following list there will be some words that have been considered as key words of the paper and that are going to be defined

- Fluctuation: continual change from one point or condition to another
- Cycle: Any complete round or series of occurrences that repeats or is repeated
- Securities: same as stocks, bonds, guarantees.
- Upward: moving, pointing or growing and leading to a higher place or point or level.
- Downward: moving, pointing or decreasing to a lower place, point or level
- Trend: change or develop in a general direction
- Financial asset: is an intangible asset that its value is derived from a contractual claim. For example we have bank deposits, bonds, stocks. They are usually more liquid than other asset like commodities or real state. They can be traded on financial markets
- Hedge: is an investment position whose objective is to offset the potential gains and losses that can happen when investing. In other words, is to reduce the loss or gain suffered by an individual or organization
- Correlation: mutual relationship between two or more things
- Market: regular gathering of people where they purchase and sale provisions, commodities, livestock.

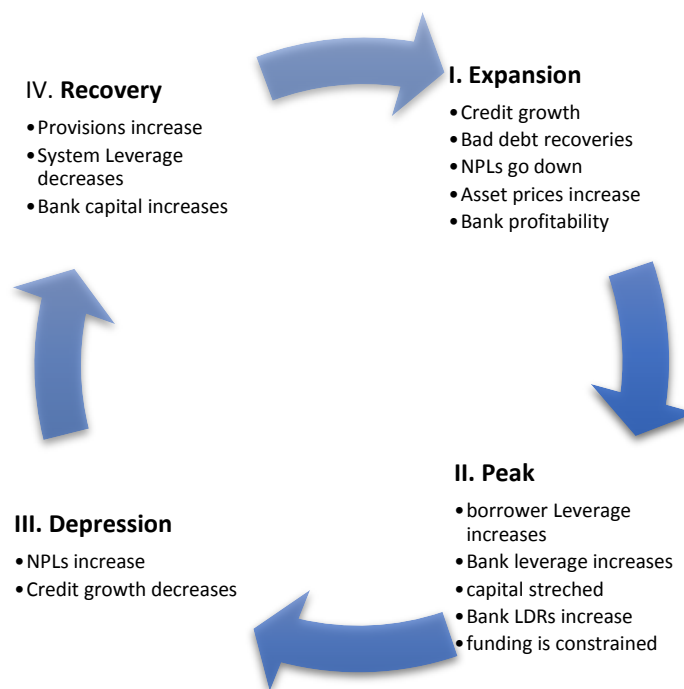
5. THE ECONOMIC CYCLES

The economic cycle is the fluctuation of the economy. Normally, it alternates periods of expansion with periods of recession. In between those two periods, after a recession phase, when the economy starts to grow up again, even though that it is an expansion stage, it is called the recovery stage. These mentioned phases are different in its own way, but there are some patterns that repeat every time that the phase begins. We have to take into account that the duration of each phase differs and also the intensity and the amplitude. The cycle lasts between two and ten years. One of the most important things that produce the changes between phases, is the imbalance generated by the different economic agents that have influence in the variables.

There are some variables which are really important and to which we have to pay attention in order to know in which stage of the cycle is the economy. These variables are: Gross Domestic Product, interest rates, levels of employment, consumer spending and also inflation.

Moreover, the macroeconomic indicators are not the only variables at which economists and agencies take attention to. Another indicators that gives us a clue about in which stage is the economy, are the ones that come from creditors. This is, when banks cut the credit (credit crunch), this means that they stop lending money to consumers and companies, which is a sign of weakness.

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Graph 1. Credit Cycle

In the following pages we are going to analyze in detail the different phases including information about the most common policies that are run out by the governments and also by the different agencies of each country. Before that, we are going to define the previous variables in order to understand better the different policies carried out by the agents and also how can this affect to the different investments made in the markets we are going to analyze in this thesis.

- **Gross Domestic Product (GDP):** It's the monetary value of all the goods and services that have been produced in a country during a specific time period, usually a year.
- **Interest Rate:** known as "the price of money", is the amount that the borrower pays to the lender. They are normally expressed in annual percentages. Depending on the risk profile of the borrower the interest rate would be higher or lower. If the risk of default is low the interest rate would be low and if the risk profile of the borrower is high the interest rate would be higher.
- **Unemployment:** it occurs when a person, older than 16 years old, is looking for a job but he or she is unable to find it. It is one of the most important variables in order to know the phase in which the economy is.
- **Consumer Spending:** It is another way to call the private consumption. This variable measures the expenses on goods and services.
- **Inflation:** is another really important variable for the thesis. It's the rate at which the level of prices rise and, in consequence, the purchasing power of the different currencies falls.

5.1. Expansion stage or favorable macroeconomic environment

The expansion phase of the economy is also identified as “booms” and it is a period of prosperity. Some economists identify four phases instead of three, but here we are putting together the expansion phase and the one identified as the prosperity. The prosperity point, could be thought to be the higher point reached in this phase, in other words: the peak.

During this stage the economy and all the variables inside it grow. As most of the variables we have previously mentioned are somehow “connected” when one starts to grow that has a positive effect on the others.

This growth in the economy may come from different sources: the increase of spending by companies, consumers and/or the government. During this period, companies will hire more people what will make the unemployment rate to go down. Wages will raise and thanks to this consumers will increase their purchasing power what takes us to the initial source of growth: the increase of spending. As demand of good and services will increase, companies will make large orders in terms of materials, supplies and machineries, in other words: investment increases.

Finally, during the expansion period, the growth of economies reaches the highest point, and also the growth of the profits in companies also reach a peak. At this point, governments stablish softer policies and the credit growth is strong. Summarizing, during the maturity of the phase the economy reaches an equilibrium situation.

The credit grows during an expansion period. The bad debts accumulated by companies' recovery and the negative profit and losses accounts go down. Moreover, as there is more money available in the market the price of assets increases and also the profitability of the banks go up.

When the expansion reaches its maximum point or peak, this variables of the credit cycle (which we have already mentioned that is related to the economic one, as is inside it) also reach maximum points. Borrower leverage increases, bank leverage increases too and capital is stretched. On the other hand the bank LDRs (Loan to deposit ratio) increases while funding is constrained.

5.2. Recession stage or unfavorable macroeconomic environment

The end of expansion phase happens when it reaches the highest point or “peak”. This peak shows a change on the trend and in the economy indicating the beginning of the recession or “contraction” phase.

As in the previous phase, the intensity and the duration of the recession varies. We have to distinguish during this contraction stage the terms “recession” and “depression”. With this two terms we can refer to the different intensity of the contraction. The word recession means a moderate contraction of the activity while the term depression refers to a more tough and hard contraction of the activity.

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First, when the expansion phase ends, the economy starts to slow down and to fall. Economic growth moderates and credits start to be tighten. Governments start to establish restrictive policies while corporations' profit margins start to deteriorate. Inventories start to grow while sales start to fall.

Secondly, when the recession phase reaches the economy suffers a strong contraction in the activity. Companies' profits decline and banks stop giving credits to all the agents of the economy. The slowdown of the variables we have commented previously becomes stronger and the economy can reach a depression situation.

The effects of this slowdown are seen in the different economic variables, for example unemployment. The different economic agents cut off their spending during the recession period. This consequence comes from the changes produced in the whole economy. There is a decline in production that comes with a lot of jobs lost which makes the unemployment rate to grow during this period. This generates that private consumers see their income reduced and the direct consequence of this is that they stop spending money. On the other hand the demand for goods tends to reduce and that causes a reduction of companies' profits. Some companies are not able to face this unfavorable economic situation and that leads them to the bankruptcy.

As there is a lot of uncertainty in most of the markets investors and consumers become more concern about what is going to happen in the future and that causes that investments in fixed capital is strongly reduced.

There is a lack of liquidity in the markets and banks cut of their credits, and governments have to establish tough monetary and fiscal policies in order to try to maintain the expenses for the country.

During this stage, negative PLs (Profit and losses accounts) increase and credit growth decreases.

5.3. Recovery stage

When the recession and depression period ends it's the turn for the economy to recover. During the recovery period the economic activity starts to grow back again. Growth rates start to turn positive. Banks start to give credits again and companies' profits grow rapidly as their sales improve and the inventories seem to low. Even though in this phase the economy has left back the worst governments still establish stimulating monetary and fiscal policies in order to make the economy grow by creating a "healthy" environment.

Consumer spending starts to grow what causes that the demand of goods and services increases. As we have seen in the previous phases this triggers numerous effects on the rest of the economy indicators.

As companies need to increase their production in order to be able to satisfy the increasing demand, they start to hire more people, what makes that the unemployment rate decreases. Companies start investing in fixed assets and investors are now recovering the confidence in the market and they are willing to take more risks and also invest more. Governments still stimulate the economy by establishing both expansive fiscal and monetary policies.

And finally, banks are also optimistic about the economic situation and they start giving loans to private and institutional borrowers which provides the market with more liquidity.

When the economy seems to be recovering credit cycle does too. We have already mention some effects of the recovery in terms of credit. Provisions increase while system leverage decreases. In terms of bank capital there is an increase.

6. FINANCIAL MARKETS

“A financial market is the mixture of markets in which the deficit units (those whose current expenditure level exceeds current income level) get financial resources from the surplus units, either in a direct, immediate or managed way.”¹ This was the definition given by the economist Robert William Goldsmith.

For those people who have not a lot of knowledge in economics or financials we could say that: financial market is the place where economic agents who need money go to look for it, and those agents who have liquidity lend the first ones the money expecting a return, not only during the term of the investment but also when they receive their money back.

The key words in order to understand the financial markets are: profitability, return rates and financial asset.

We understand as profitability as the difference earned by the cost of one asset at the purchase moment and the selling price. For a financial asset we can measure this profitability with different ratios but the most commonly used is the price per earnings ratio.

The return rate is a similar concept as the profitability one. Is the gain or loss an investor has or will have during the specified period time that the investment lasts, and is expressed in percentage.

Finally, a financial asset is a liquid asset that is bought or sell by doing a contract between two parties in which one will get a return during the term of the asset. Examples of financial assets could be stocks and bonds.

6.1. EQUITY MARKET

This market is the most popular and well-known market. The financial product traded on this market are the shares. It's really important for the economy because it provides companies the possibility to access to capital. In other words, it's a source of funds. This shares can be either traded in exchange markets or in over-the-counter markets.

First, we have to know what shares are: they represent a part of the issuer company. The return provided by the shares are linked to the benefits and the dividend policy of the issuer. The investor that purchases shares of a company becomes a shareholder which gives them some benefits such as the economic right in case of liquidation and commonly also the right to vote.

¹ Goldsmith, R. “*financial Structure and development*”- Yale University Press, 1969

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Keeping on with the overview of what an equity market is, we should know that is an important part of the economy because as we have mentioned before, companies have the opportunity to get some funding by selling their shares and investors have the opportunity to get some profitability of their money.

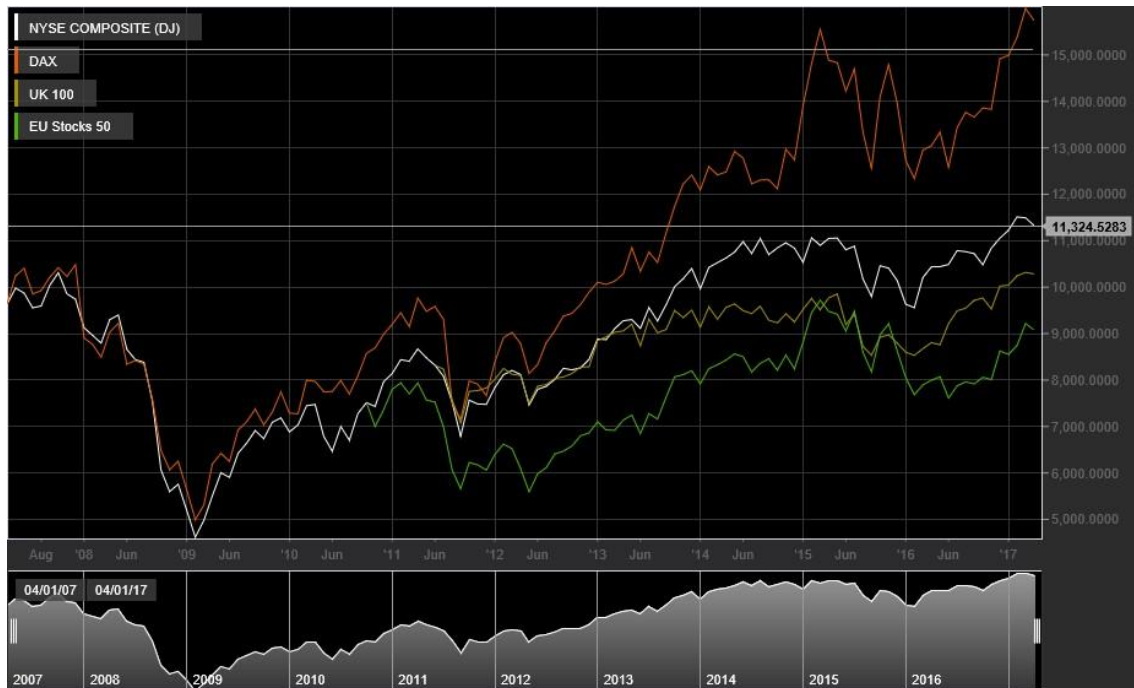


Image 4. NYSE, DAX, UK 100 and EU Stocks 50 performance in the last 10 years (Source: www.teletrader.com)

In the previous image, there is a chart in which we can see the evolution of some stock exchange markets during the last 10 years. We have included the NYSE, the DAX, the UK 100 and the EU Stocks 50 in order to make a comparison of different countries to see how the different stocks are and to preview their performance in the last 10 years.

When we see the different stock exchanges rising it's a sign of a healthy and growing economy and when there is a downward trend in the stock market we tend to see how the economy starts to weaken. If we take a look to the graph we can see that when the last financial crisis started the stock markets all around the world started to crash.

The securities that are traded in here can be public stocks or private stocks. The public ones are the ones which are listed on the stock exchange. There is a big number of stock exchanges all around the world. Big companies have listed stocks and, moreover, this stocks are listed in various stock exchanges, for example: NYSE, IBEX 35, AEX...

Investors, in this market, want to buy stocks at a certain price and the issuer will do it at a certain price. When this two prices match, the sale comes. The objective seek by companies when they put in the market their shares is to make the company bigger. The equity market can be divided in two different markets: the primary market and the secondary market.

The primary market is where new shares are offered for the first time normally by the company; and the secondary market is the place where subsequent trading takes place. In the secondary market the securities go directly to the investors.

Stock markets have some characteristics that are similar to the other markets, but they have a higher volatility than the others, as the stock market is the first one that reacts over the performance of the economic agents. From my point of view, the stock markets is one of the riskier markets that exists. One day you own a certain number of shares of a company which performance is really good, and then something can happen, such as a litigation, some new information about its financials and then you can see yourself owning a package of shares of a company which its value has been dramatically reduced. This is something that has happened with the Spanish bank Banco Popular, who in the middle of 2017 has lost more than a 20% of its capitalization.

6.2. BOND MARKET

Accessing to the bond market is a quite good decision in order to diversify the different sources of financing.

A bond is financial product where the issuer asks to the market for financing. In return, the issuer offers a profitability based on a fixed rate which will be payed annually or based on a floating rate that is usually paid every three months, and also the issuer commits to give back to the investor the principal amount invested when the term ends.

There are different kind of bonds. They can be classified in different terms: depending on the kind of issuer and depending on the kind of investors and documentary requirements.

If we classify them by the kind of issuer we will find three type of bonds.

The first one would be the sovereign bonds. These bonds are issued by national and regional governments or by different national and supranational agencies and bureaus.

Secondly, we can find the financial institutions bonds, which are issued by banks and saving banks.

And thirdly, we have the corporate bonds, which as its name says, are issued by private companies.

On the other hand, if we attend to the classification by the kind of investors and documentary requirements we will say that there are three type of bonds.

Investment grade bonds are those which rating is higher than BBB-. Then, we have the high yield bonds which rating is lower than BBB-. And finally, the cross-over bonds are those which rating is in between the investment grade (BBB) ones and the high yield (BB) ones.

There are many differences between the two first types of bonds, but one of the most important is that the risk of default is higher in the high yield bond than in the investment grade bond. This is the reason why the high yield bonds are more profitable, because at more risk more profits.

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Investment Grade Bonds	S&P	
	AAA	Prime Bonds
	AA+	High Grade Bonds
	AA	
	AA-	
	A+	Upper Medium Grade Bonds
	A	
	A-	
	BBB+	Lower Medium Grade Bonds
	BBB	
BBB-		
High Yield Bonds (Junk bonds)	BB+	Non-investment Grade Speculative
	BB	
	BB-	
	B+	Highly Speculative
	B	
	B-	
	CCC+	Substantial Risks
	CCC	Extremely Speculative
	CCC-	In default with little prospect of recovery
	CC	
C	In default	
D		

Table 1. Types of bonds (Source: own)

6.3. FX MARKET

The FX market, or Forex market, is a very liquid and complex market which operates the 24 hours, where currencies are traded. The investors in this kind of market operate managing a big quantity of funds buying and selling foreign currencies. Normally, this investors tend to be banks and companies.

When defining what is the FX market we have mentioned some of its main characteristics. In this type of market there is a huge volume of trading. The daily operations can have a value up to 1 billion and a half dollars.

On the other hand this market is really transparent because the price of the different currencies can be known easily, not only because nowadays you can have real-time information but because the product traded in this market is homogeneous and unique.

The currencies market has a great influence in the economy and has been really important during the last crisis.

There are some important concepts we need to know in order to understand how the market works and later on to analyze the correlation of this market between the other markets we have been studying.

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- *Foreign Currency:* It's a payment made in another currency different from the one of the payer's country. This concept is usually used and linked to the different transactions made between banks because they trade a high volume of different currencies while in the domestic market this kind of trading is really low in comparison.
- *Exchange Rate:* It's the price of one foreign currency in terms of another. For example today if we want to buy 1 euro we would have to pay 1,06 dollars. This price is not fixed, it varies. These changes are due to the increase or decrease of the imports and exports, the changes in the investment trend or the changes in the interest rates that have some influence in the offer and demand of the currencies. This might be the most important concept related to the FX market because it affects the capital transaction between the countries involved in the different operations, and that's the reason why investors use different hedging strategies in order to be protected of the interest rate risk.
- *Appreciation or Depreciation:* it is the increase or decrease of the price of one currency regarding another one.
- *Valuation or devaluation:* This concept is really similar to the previous one. A valuation is the increase of the price in one currency and the depreciation is the decrease of it, but the difference of these concepts remain in the use. We use these last terms (valuation and devaluation) when the different economic authorities establish adjustments because of market pressure, when the fluctuation of the price becomes huge or when a currency leaves a really long-term trend.

Central banks, like the ECB, make interventions. These interventions are purchases and selling of a currency that is used to influence the different exchange rates.

6.4. COMMODITIES MARKET

The commodities market is the one where raw materials or primary products are traded. There are a hundred of commodities that can be traded in this market, but there are only 50 (the top 50) which are better for investments.

Commodities can be classified in two: the hard commodities and the soft commodities. The first ones are the ones that are natural resources that need to be extracted in order to use them. Inside this classification we would find for example the oil and the gold. On the other hand, the soft commodities are the products that come from agriculture, for example: wheat, coffee, corn and sugar.

But, how do investors put their money in this market? Do they buy a piece of gold? No. Investors typically have two ways of investing in commodities: either they invest their money in companies which its core business is focused on the production of some commodities or they buy a future contract in which they sign that the holder of this contract is going to buy or sell a certain commodity at an agreed price on a fixed date in the future.

We can also classify the commodities depending on their origin. We have energy commodities, agriculture commodities, beverages, agricultural raw materials, metals and minerals, precious metals...among others.

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- *Energy*: The crude oil is one of the most common commodities in which people invest. It is also an indicator at which financial markets look at. Also the natural gas is an important commodity in terms of energy commodities. The crude oil is a really important commodity which has a lot of influence in the economy.
- *Agriculture commodities*: food, like rice. There are some risks on this commodities, when forecasting their prices, linked to the energy prices and the fertilizer prices. Moreover, they are also influenced by the weather patterns. For example, if oil prices suddenly increase more than what was expected it can make the agriculture commodities prices to increase too.
- *Beverages*: such as coffee and tea, orange juice.
- *Agricultural raw materials*: such as cotton and natural rubber.
- *Metals and minerals*: like zinc, nickel, aluminum.
- *Precious metals*: such as gold, silver. The gold is also a common commodity to which investors decide to destiny their money.

6.5. OTHER PRODUCTS

The markets and products we have commented in the previous pages are the most common and known, but there are other type of financial products in which investors decide to put their money.

Not only this, some people invest in Real Estate, which is not a financial product *per se* but is a good investment, because building can appreciate a lot in a short period of time. Inside real Estate we include three type of categories: there is the residential, the commercial and the industrial. It's important to take into account that investing in residential real estate is not the same as investing in commercial or industrial real estate where the return of the investment comes from the profitability of the size of the building and the land in which the building is, in other words the square per foot. As we will mention later on the analysis, on the real estate market the economic situation of a country is crucial in this kind of market. The economic period in which a country is will determine the prices and movements in term of supply and demand of the real estate market.

Investors do not invest in just one product or market, they usually diversify in order to get more return and to get more profit and also to make hedging strategies in order to cover the risks associated to the different products.

One of this products that we mentioned are the convertible bonds. They are products with bond and stock features. It is a bond that gives in return to the investor a fixed coupon but also it gives the right to the holder (the investor) to convert that bond in shares of the company that has issued that bond. These bonds usually have a low coupon yield but issuers compensate it with the special feature of allowing to the investor to convert it, which is a value-added feature.

On the other hand we have the Real Estate investments. As we will mention later, in crisis periods the real estate prices decrease and investors take advantage of the situation and start buying buildings in order to rent them or sell them in the future when the price of buildings increase again.

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There are some products that investors use in order to hedge the risks associated to the different stocks, bonds, commodities...in which they have invested their money. For example, we have the put/call options and futures contracts.

The put option is a financial contract that gives the holder the right (not the obligation) to sell an underlying asset at an agreed price in a specific moment. On the other hand, the call option is a contract that gives the holder the right to buy an underlying asset at an agreed price in a specific moment. The underlying asset is a financial product in which the holder has invested, for example: a stock, a bond, a commodity.

A future contract is similar to a put or call option. The parts signing the contract agree to buy or sell a commodity or financial instrument at an agreed price in a specific date in the future. This contracts are commonly used to hedge the risks associated to commodities. It is used also by speculators in order to get a higher return on their investments.

7. INTERMARKET ANALYSIS FINANCIAL PRODUCTS AND ECONOMIC CYCLES

In the following pages we will focus on the main topic of this paper. There are a lot of financial products. Some of them have been presented in the previous paragraphs but there are a lot more in the financial world.

What is an intermarket analysis? Is one of the legs of the technical analysis, and it studies the correlations between the four main assets classes: stocks, bonds, commodities and currencies. In this paper we will also include the study of the correlation with the real estate investment. One of the references used in this paper is John Murphy's book: Intermarket analysis.

It is known that there is an obvious relationship between these four major assets type. The analysis of this relationships helps analysts to determine the phase in which the economy is and therefore, the investing phase or investors' behavior in that moment. This relationship are also influenced by inflation. As we have commented is an important variable for the economy and shows changes in the economic cycles.

During this chapter I will speak about the correlation of the products I have describe versus the stocks. The reason is that one of the most common investments is in equity or stocks and from this point of view it seems interesting to analyze the correlation with other products and also I will compare this movements in those products with the economic growth, in order to see if there is any kind of relationship between the level of investment in an specific product and the fluctuations of the economy.

The procedure I'm going to follow to develop this chapter is going to be the following:

- First, I will analyze the correlation between different financial products (remember we will analyze the most common and generic types). I will use some graphic tools in order to have a visual image that helps us understand that correlation. During this analysis we will analyze the correlation between the corresponding assets and also how did it behave during different economic situations by using different variables of the economy, such as inflation, growth...among others.

- Secondly, when the correlations analysis is done I will use that information and, again, graphs, to analyze the relation between those products and the economic fluctuations in order to get a conclusion that will allow me to answer the main question of this paper: "where do people invest if there is a crisis? And if there is an expansion period?"

7.1. THE RELATIONSHIP BETWEEN STOCKS AND BONDS

When creating a portfolio, a general assumption is that there is no perfect correlation between the different assets, and the case of stocks and bonds wasn't going to be different.

7.1.1. Drivers of stock prices and bond yields

Prices are one of the key things at which investors take a look at, because depending on the price and its expectations they will invest in one asset or another in order to get the maximum profitability.

Prices in bonds are determined by the risk-free rate, which will last over the life of the bond, plus a premium that compensates investors for the uncertainty about changes that can occur in the future value of the bond. Changes in the value of the bond can come from changes in interest rates and changes in inflation.

On the other hand the prices of stocks are determined by the present value of the future and expected dividends payments. These dividends are discounted by the evolution of the risk-free rate and the equity risk premium. This equity risk is a premium given to investors to compensate them in order for them to hold riskier stocks.

Moreover, not only these variables affect the prices of stocks and bonds but also the expectations of uncertainty, growth and inflation. Again these variables are key drivers of the evolution of the economy.

There is uncertainty about how these variables can influence the prices of both bonds and stocks through the premium of bonds and the equity risk. Apparently, if the uncertainty of growth increases that will increase the equity risk, as in moments of lower growth stocks can be more volatile and therefore riskier, but it will lower the premium. On the other hand, if inflation increases this uncertainty rises both premiums.

Positive growth or inflation has an effect on bonds by rising the yields but it has an uncertain impact on stock prices. This generates that the sign of the correlation between these two assets depends on the changes of the dividends offered by these two assets by a higher or lower discount rate.

In the end, growth rises the correlation between the assets, as if there is a stronger economy this will have a positive effect on expected dividends having a positive impact in stock prices that will rise.

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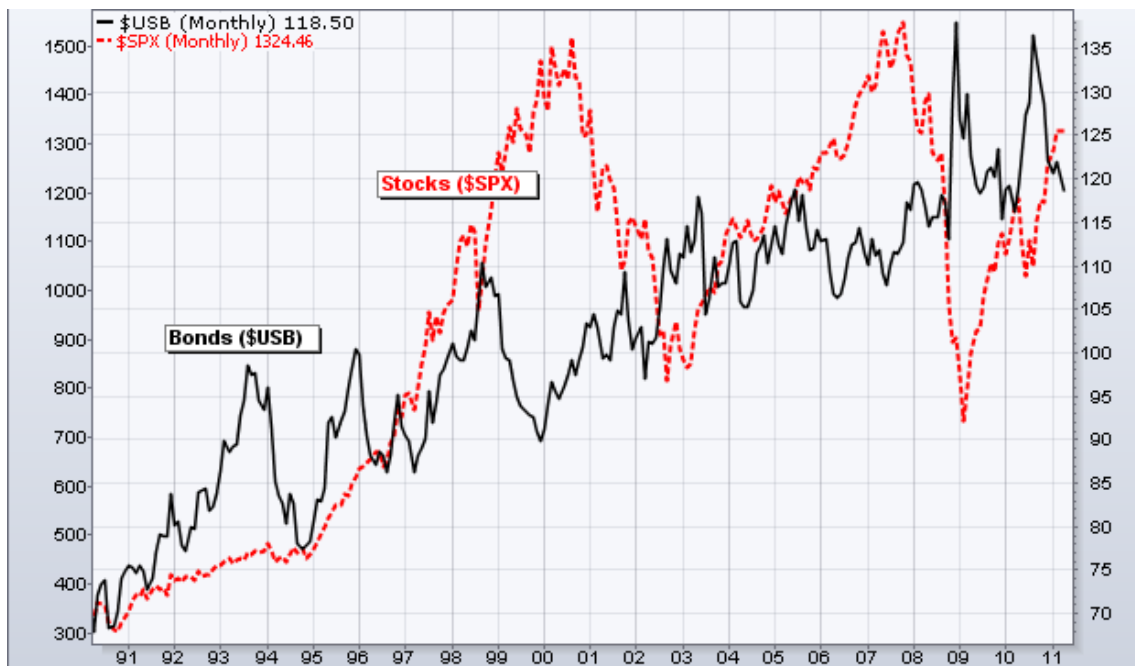
Inflation will smooth the correlation, since a higher inflation causes the increase of interest rates can take down the positive effects on dividends generated by the growth.

Changes in uncertainty also generate changes in prices of these two assets. The higher the uncertainty the higher the equity risk what will low stock prices because investors don't want to hold such a big risk and bond premium declines. If there is a lower uncertainty the effect would be the opposite of the one commented in the previous lines.

7.1.2. The evolution of stocks and bonds correlation

In order to study the correlation between bonds and stocks we are going to take as an example the US stocks and bonds. As we are going to see in the following graph, the US stock and bond correlation has been behaving differently in the past years.

First, before analyzing the correlation between these two assets with the economic variables (the ones that can give us a clue about how the economy is doing), it would be interesting to see how is the behavior of both assets with the objective of getting a previous conclusion about the topic in terms of bonds and stocks.



Graph 2. US Treasury bond VS S&P 500 (source: Stockcharts)

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In the previous graph we can see the evolution in the last 10 years of the 10 year US Treasury bond² and the Standard & Poor's 500 Index or the S&P500...

Before continuing with the analysis of the graph I'm going to define the assets I have chosen to make a first approach to the behavior of stocks vs the behavior of bonds. The 10Y Treasury bond as it name says is a bond offered by the US government with a 10 year term. On the other hand, the S&P500 is an index of 500 stocks. It is considered as the leading indicator of U.S equities and a reflection of the performance of the large cap universe. It has been made up by companies chosen by economists.

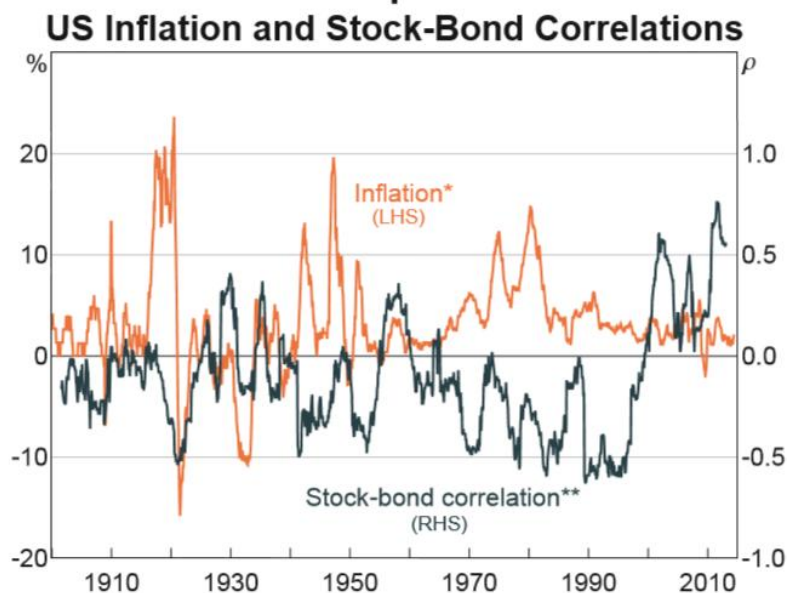
Now, if we take a look to the graph above these paragraphs we can see that the evolution of the bonds has been going in the opposite direction so this could give us a clue about the correlation. In this case, during this period we can see that there is a negative correlation between these two type o stocks because when one "grows" the other one decreases.

Watching at that graph we can appreciate that the data shown corresponds, mainly, to the period in which there was a global crisis therefore with an uncertainty environment. This will be explained in the following paragraphs.

7.1.3. Stocks and Bonds relationship and the economy

Now, we are going to analyze how variables such as inflation and uncertainty have affected in the last century until 2010 the correlation between bonds and stocks. This is one of the first steps that, at the end will allow me to reach a conclusion about the overall topic.

If we take a look to the following graph we can appreciate that in the 20th century, when the inflation was pretty high the correlation between bonds and stocks has suffered some changes.



Graph 3. US Inflation and Stock-Bonds Correlations (Source: Australian Federal Reserve Paper)

² The light blue line corresponds to the US treasury bond and the dark line corresponds to the DJIA

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From the 1910 to the 30's the correlation between these two products had been negative. The reason is because of the effect³ of high inflation in the prices of bonds and stocks, and therefore in the profitability that they could proportionate to the investor.

This situation happened again during the period in between the 50's and the 60's which coincides with a moment of wealth in the economy, in other words, an expansion phase of the economy. I have reached that conclusion because, even though we just have the information about the inflation, when inflation starts to increase is due to an expansion phase where consumers have more available money and that increases the demand of goods and therefore the prices.

From the late 60's to the 2000 the correlation seems to have been pretty negative, reaching the highest level of negative correlation in 1993.

After the short crisis that occurred in 1993, the economy has been growing until the beginning of the actual crisis and that has caused the decrease of the inflation and this has had an impact on the correlation of bonds and stocks that has turned into a positive correlation. In 2010 the correlation of these two assets reaches a maximum peak.

Observing both graphs⁴ we can appreciate that in graph 2 the timeline represented goes from the 1910 to the 2010, and in 2010 it seems like the correlation between this two type of assets is going to fall. This gets confirmed, somehow, with graph 1 (the one where is represented the evolution of the US Treasury bond and the S&P 500) where the evolution of the bond and the stock suddenly tends to go back to a negative correlation.

Taking into account the information provided by *graph 2*, it seems that inflation changes has been important for these two assets and its correlation. These fluctuations have contributed to a negative correlations between the equity prices and bond yields, but even though this happened there were some occasions in which this correlation turned positive.

These changes have been previously commented, but it looks surprising that each of this occasions happens during a moment in which equity markets are volatile and there is an economic recession. When there is an inflationary period, stocks react in a positive way because interest rates fall and due to that the price of bonds rises. In a deflationary moment, the correlation between stocks and bonds is negative, or in other words inverse. In that moment, when one asset rises the other falls.

This economic situation has as a consequence a downward movement of the term premium on bonds and also an increase of the risk around equities, which at the same time makes prices of equities to decrease. The final consequence is that the correlation is pushed upwards.

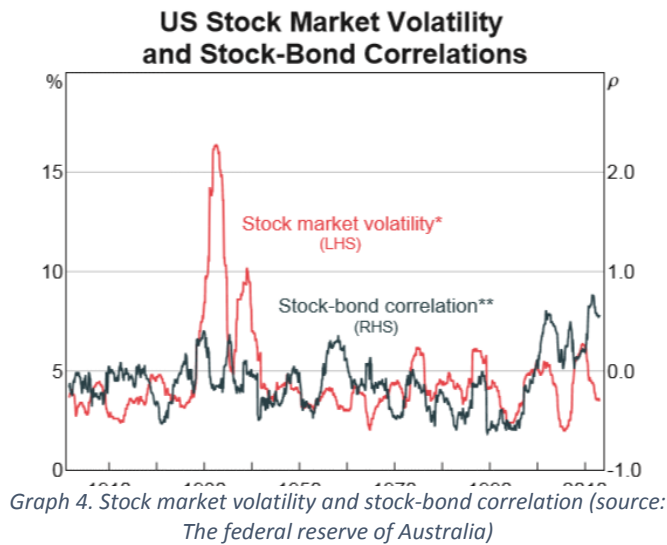


³ This has been explained in the previous point: "drivers of stock prices and bond yields"

⁴ It refers to the graph in the chapter 6.1.2 and to the current graph that has been analyzed in 6.1.3

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On the other hand the rise of the correlation between assets and bonds can be due to a shock on growths or expected growths which will have a similar effect on the prices of equities, the risk of equities and the bond term premium.



So as we can see in this graph it is shown that volatility in stock markets has as a result an impact in the correlation between this two major types of assets.

When does volatility appear in stock markets? When there is a recession period the uncertainty lives together with all the agents that participate in the game of the financial markets, especially in the stock market. The magnitude and persistence of the economic and financial crisis shows

that there is a response by correlations to a situation of uncertainty and loss of confidence of investors in the market.

This first approach to the correlation between major assets and the impact of the economy in this correlation is taking us to think that it can be possible that two assets don't have to be necessarily negatively or positively correlated anytime. In other words, correlation fluctuates together with the economy.

7.2. THE RELATIONSHIP BETWEEN STOCKS AND COMMODITIES

A business or economic cycle can have an impact on the correlation between equity or stocks and commodities. Companies use commodities as a variable inputs to production, but in a recession period they will have to reduce costs and this affects commodities.

As we have been able to see in the first part of the paper and also in the previous chapter⁵ stocks are affected by the growth of companies and in depression periods companies tend to lower their growth which, again, is translated into a lower price of the equities. This effects are signs of the deterioration of the economy and this generates that the correlation between commodities and stocks increases.

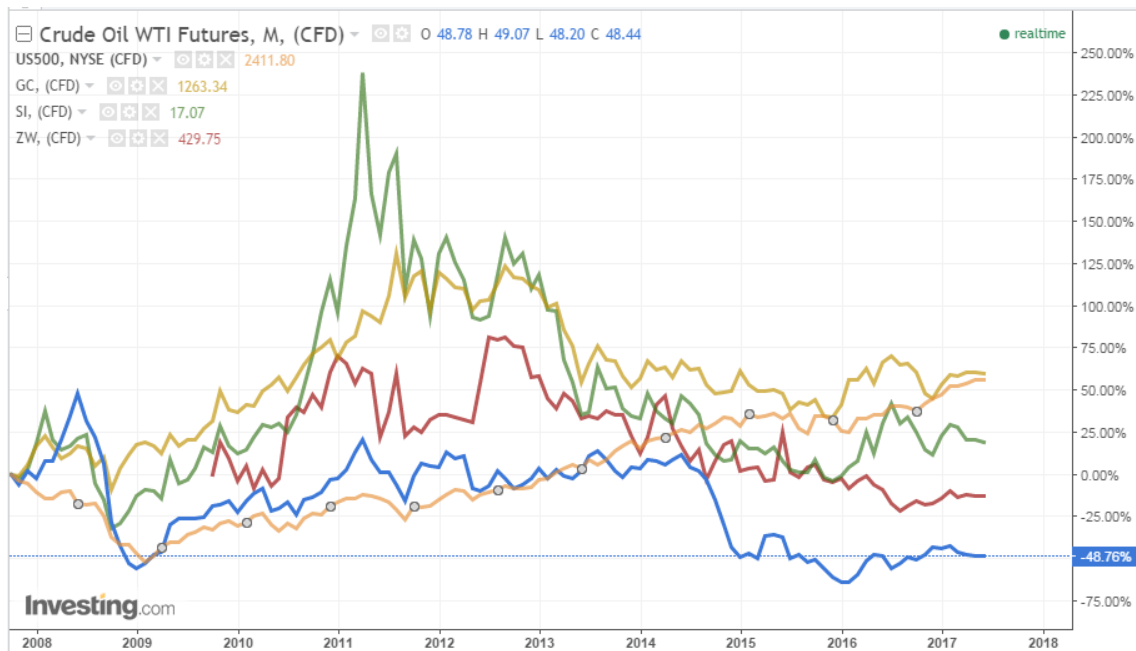
Moreover, there are some commodities in which people invest but now for profiting with the commodity itself but also because of trading.

⁵ Chapter 6.1 correlation between stocks and bonds

7.2.1. The evolution of stocks and commodities relationship

As in the previous case, first of all we are going to analyze the apparent correlation that exists between stocks and commodities. Is it positive? Is it negative? Does it fluctuate depending on the economic situation or is it stable?

We will use some graphs in order to illustrate the situation and then I will make a brief comment about what looks that happen between these two markets. In this case we are going to take again the S&P500 as the stock reference to make the comparisons and the analysis and also we are going to take as examples of commodities: crude oil, gold, silver and wheat⁶.



In the previous graph we have the evolution of the S&P500 and certain types of commodities. As we have said we have chosen crude oil, gold, silver and wheat and the three of them appear in the previous graph. The S&P 500 is represented with the orange line, gold is represented with the yellow line, silver with the green one, and finally wheat evolution is shown with the red line.

If we observe the graph we can see that the S&P 500 and silver seem to have a positive correlation. When stocks experience an upward movement silver tends to suffer the same evolution.

In a certain point, crude oil and stocks (in this case represented by the S&P 500) had a more positive correlation, but it hasn't been until the middle of 2013 when the correlation has turned negative. This event will be commented when analyzing the relationship between the correlation of this two assets and the economy.

⁶ Not all of them may be used continuously in the graphs but they will be used to do the analysis

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The correlation between gold and stocks seems to be pretty negative, even though we can see that there have been some periods in which they have suffered a similar evolution in terms of upward or downward movements.

What is seems more clear is that the correlation between wheat and stocks is negative. When one grows the other one decreases.

Maybe we cannot stablish a rule for the correlation between stocks and commodities but, as in the case of the correlation between bonds and stocks, there can be some events happening in the economy that provoke a change in the correlation between two assets. Therefore, as in the previous case, there some economic variables that can influence the correlation and depending on the moment and on the overall economic situation the correlation between two assets, being one a commodity, can change over time.

Anyway, the correlation between equities and commodities is not that clear and obvious. Some studies⁷ have shown that when stock markets performed bad commodities did it better if we compare it with other type of assets. As we will see later, for example in 2007 when the financial crisis started, the stock markets started to fall and the commodities market fell too. This is the reason why we can't say that we are 100% sure that the correlation between these assets is positive or negative, because as it is said "it depends".

After analyzing the graph, we can also conclude that commodities are very volatile assets. Just taking a quick look to the image, we can appreciate that all the commodities that we have chosen as a representation of the market have big upwards and downwards that are accompanied by small and common oscillations. Prices in commodities experience quick changes, and this is due to the number of purchases and selling's that are continuously modifying the price of the future in commodities⁸.

7.2.2. Stocks and Bonds relationship and the economy

In the previous mini chapter we have seen the correlation between this two types of assets, but now I am going to analyze how this fluctuations are linked to the economic situation of a country.

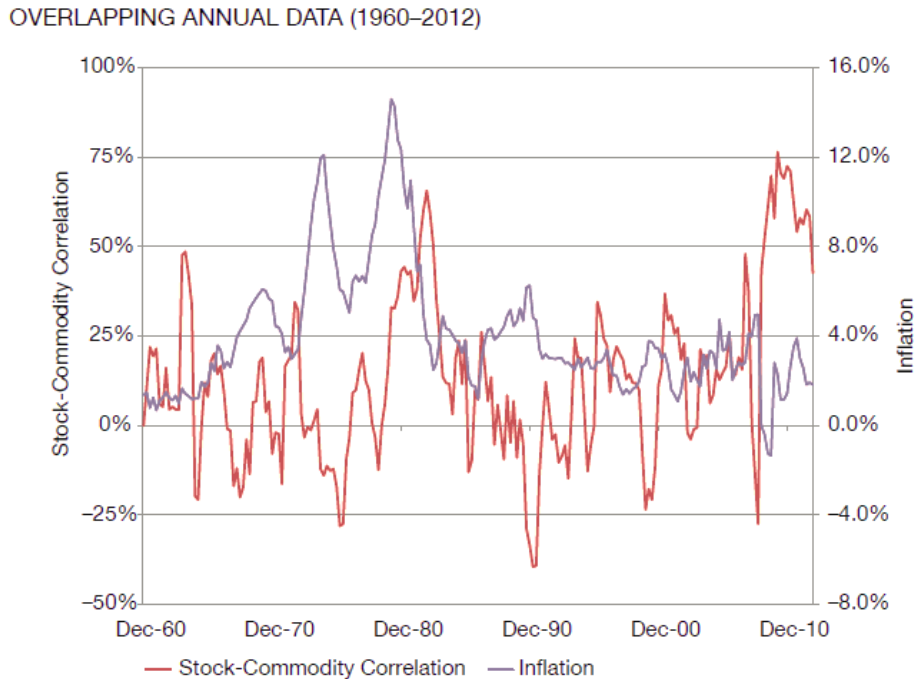
As in the case of stocks and bonds, the main economic variable that I am going to analyze will be the inflation.

In the following graph we can see the correlation between commodities and stocks and its comparison with the inflation. With this we are going to be able to see if in a determined moment of the cycle the correlation between these assets changes or is more constant. The graph represents the relation between these variable from the 60's to 2010 and in a 10 year scale.

⁷ *Correlation Analysis between commodity market and stock market during a business cycle. Dr. Arvind Kumar Singh, Karan Veer Singh*

⁸ When investing in commodities you don't buy or sell an amount of gold for example. Trading and investing in commodities is done through futures contracts.

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Graph 5. Stock-Commodity correlation and inflation (source: the business cycle and the correlation between stocks and commodities)

By taking a look to graph 6 we can appreciate that most of the time the correlation between commodities and stocks is positive. This is that when prices of commodities rise, the price of stocks rise as well.

The relationship with the economy seems to show a similar case as in the stocks and bond analysis. The correlation between these two assets changes depending on the health of the economy. This is, in the period of the 70's the correlation between commodities and stocks is negative, and if we pay attention to the graph we will see that this matches with a high inflationary period, or in other words an expansionary period of the economy.

On the other hand, in a moment where inflation not only decreased but reached negative points (deflation) the correlation between the assets was highly positive, reaching a maximum peak in the last 50 years. So, definitely, during a deflationary period the relationship or correlation between stocks a commodities is negative or inverse.

By the end of the XX century, oil prices started to rise and this lead to a lot of a series of events that made stock markets start a bear in 2000. In the following year, in 2001, a recession arrived. The rising prices have helped, virtually, to every United States recession. When the recession came after the rising of prices in oil, the Federal Reserve of the United States started to tight the interest rates, which contributed to the ending of one of the longest periods of expansion that has been. By taking this decision the Federal Reserve made that an inverted yield curve started. This is one of the classic signs of a weakness in the stock markets that will have as a consequence the beginning of a recession.

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Even though that in that paragraph we are not making any clear comparison of the oil evolution with stock markets, it is true that there are some decision taken by agencies on some asset that can cause a slowing down of the economy which will lead to a slowing down of the stock markets (and also the others, but is much more visible in the stock markets) and will have as a final effect the start of a recession.

During the las part of the XX century, again, the gold, which is another important commodity, was experiencing a downtrend. This happened as a consequence of a disinflationary environment that lasted the last twenty years of the twentieth century. It is important to know that when stock markets are experience an upward trend the gold experiences a downtrend, so that confirms that there is a negative correlation between these two types of assets.

These two last commented commodities have a lot to do with inflation, as the changes in its prices have an impact on inflation. If there is a huge change in the price of gold, investors may think that something is happen with the overall market or, also, in the economy. The trend of the price of gold has an influence on the trend of the gold mining shares.

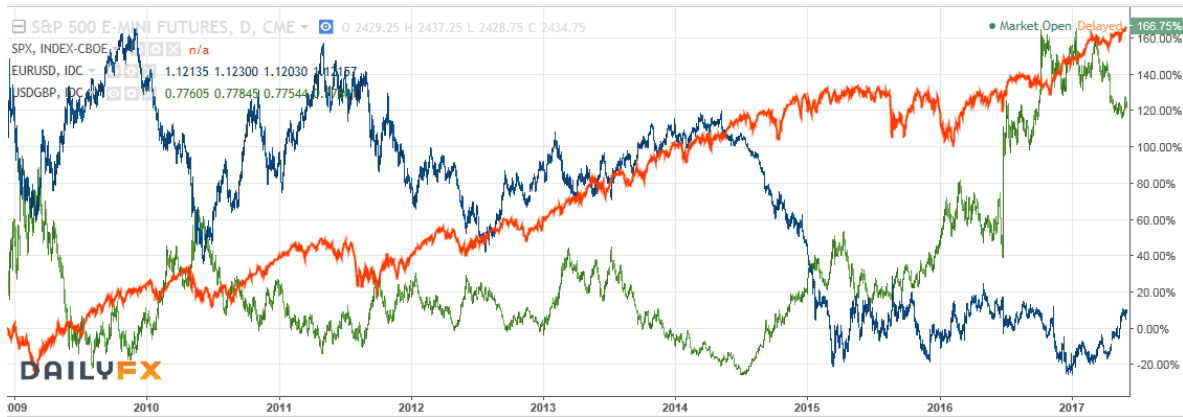
On the other hand the price of energy has a psychological effect on the inflation. But these changes are also pretty important for the economy. In a moment of low prices were there is not a lot of demand, this could cause that prices on gas, for example rise, and can make the principal companies and governments who have oil production to cut down the production, and that rising on the prices will have impact on the inflation.

7.3. THE RELATIONSHIP BETWEEN STOCKS AND EXCHANGE RATES

In chapter number 5 it has been explained the concept of exchange rates, which is the indicator for the price of a currency in terms of another currency.

There is an approach to determine an exchange rate: "the asset market approach". This approach is based on the premise that exchange rates vary and are influenced by news or announced changes in some economic variables, such as the growth, inflation, taxes...or the most recent case in England where the exchange rate of the pound fell after the referendum about the Brexit.

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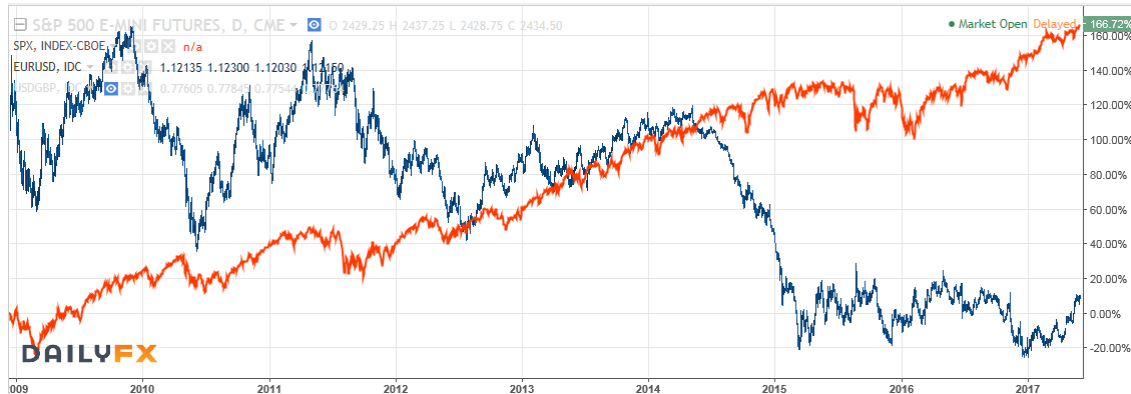
Graph 6. S&P 500 VS USD/EUR and USD/GBP (source: dailyfx)

If we start our analysis through this premise we could think that the correlation between stocks and exchange rates is higher than it really is.

In graph 6 we have a comparison between the S&P500 index evolution, as we have chosen this index as a reference, and the evolution of the exchange rates of the euro versus the dollar (USD/EUR) and the one for the Great Brittan pound (USD/GBP). The timeline that I'm going to use as a reference, in this case, to analyze if there is any existing correlation, is the period in between 2009 and today.

At a first glance, it appears that depending on the currency you are using to make the exchange rate you will see a correlation pattern or not.

Let's begin with the USD/EUR exchange rate and the S&P500.



Graph 7. S&P 500 vs USD/EUR

When making a quick view of the graph we observe that there might be some kind of correlation. If we analyze the movements of both indexes we will see that the existing correlation is a negative one. When the S&P 500 tends to grow and begins an upward trend, the USD/EUR experienced a lot of small upward and downward trends, but if we pay attention to the principal trend we will see that is a downward trend. Even though we could think that there isn't any correlation because the evolution, in a percentage term, of the foreign currency is higher we have to focus on the trend and the main movement.

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This might seem meaningless, but this shows that in the period that we are analyzing there is a negative correlation between both indexes. When the economy and the markets, in this case the US one, are growing and experiencing positive results, the rate between USD and EUR tends to decrease. This is that if a country like the US is living an expansion situation where all the economic variables are growing, the exchange rate lowers. This is if in 2009 the USD/EUR was 0,89 after a growth of 2% of the S&P500, for example, the USD/EUR would be 0,87.



Graph 8. S&P 500 vs USD/GBP

If we proceed to look to graph number 8, we will see that the situation in this case it's pretty different. The exchange rate USD/GBP seems to have a positive correlation with the S&P 500. Before 2009, we can see that there might have been a moment in which these two indexes, that represent two of main major assets, have presented an inverse behavior. Which would be translated as the negative correlation between two assets.

Why does this happen? With one type of exchange rate the correlation seems, initially, positive and with another type of exchange rate the correlation looks like if it is negative. If we have to reach a conclusion about this situation is that there is no real and fixed correlation between these two assets.

Even though in the other cases we could say that there was a correlation that changed depending on some facts such as the aggregate changes in the economic variables, in this case and after doing the analysis, I think that the correlation between these two assets is minimum. Of course there is some kind of correlation but in my opinion is light, because nowadays with a globalized world where everyone can buy something of one country from another country and I think that the correlation between exchange rates and inflation (for example) is greater than with stocks.

7.4. THE RELATIONSHIP BETWEEN STOCKS AND REAL ESTATE

Stock and real estate markets are a piece of a larger puzzle. As we have already mentioned, the performance of the stock market reflects the health and the evolution of the economy of a country, and on the other hand the evolution of the real estate shows the real estate market evolution.

In the corporate world, for some companies the ownership of a property it's also a part of production and also is an asset.

During expansion periods companies' income and profits grow and that has as a consequence the growth and expansion of the company. This growth is translated to the stock market where the prices of these companies increase. So here we have the first asset and market we wanted to compare. Moreover, when a company starts and expansion phase, this leads to an increase of the rentals due to an increase of the demand and a short term supply inelasticity.

If rental prices increase, then that will lead to higher capital values in the real estate market and therefore rise the value of the assets what will cause a rising in the stock prices.

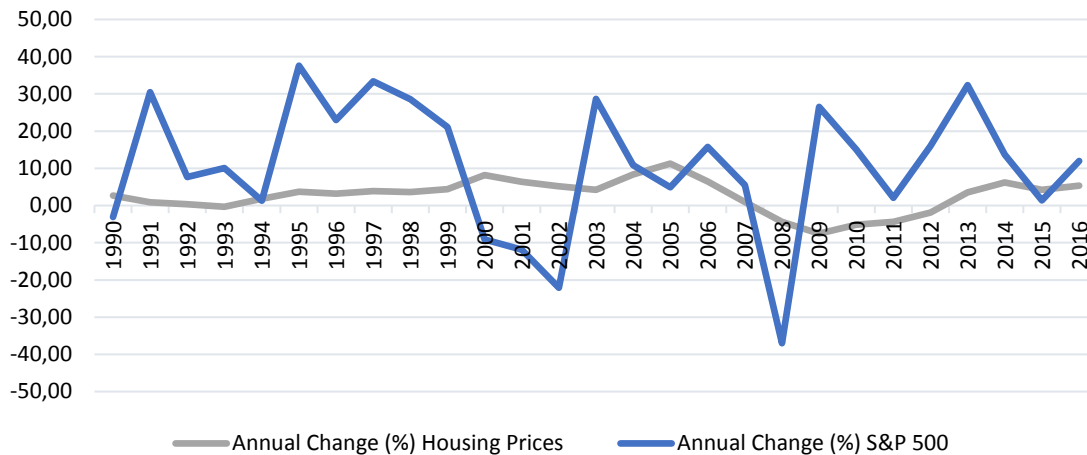
1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
2.65	0.89	0.33	-0.35	1.83	3.70	3.22	3.88	3.62	4.43	8.20
2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
6.39	5.20	4.20	8.36	11.26	6.43	0.98	-4.37	-7.55	-5.13	-4.38
2012	2013	2014	2015	2016						
-1.89	3.57	6.21	4.24	5.31						

Table 2. US housing pricing evolution, expressed in %. (Source: <https://www.fhfa.gov/DataTools/Downloads/Pages/House-Price-Index-Datasets.aspx#qpo>)

1990	1991	1992	1993	1994	1995	1996	1997
-3.10	30.47	7.62	10.08	1.32	37.58	22.96	33.36
1998	1999	2000	2001	2002	2003	2004	2005
28.58	21.04	-9.10	-11.89	-22.10	28.68	10.88	4.91
2006	2007	2008	2009	2010	2011	2012	2013
15.79	5.49	-37.00	26.46	15.06	2.11	16.00	32.39
2014	2015	2016					
13.69	1.38	11.96					

Table 3. Annual change S&P 500; expressed in % (Source: <https://www.fhfa.gov/DataTools/Downloads/Pages/House-Price-Index-Datasets.aspx#qpo>)

US Housing Prices VS S&P Annual change



Graph 9. US housing prices evolution VS S&P 500 evolution

In graph 9 it is shown the evolution of the S&P 500 in an annual basis and the evolution of the housing prices in the US. Both data are expressed as a percentage change during in a year.

The housing pricing data has been taken from the federal housing agency, and it is going to be compared with the evolution of the S&P 500 because this index tracks the market value of the stock.

The variation of the housing prices is more or less stable and the stock index is much more volatile.

In order to see if there is any correlation between these two economic measures we have to take a look to the trend of both data. From 1990 to 2000 we can appreciate a positive correlation between both indexes. During the moment of wealth and expansion the housing prices seemed to grow a little year by year. In the period between 2000 and 2003 even though that housing prices changes are still positive and the return of S&P is negative, the trend is downward and that indicates that there is still a positive correlation, because when stock goes down and the economy is entering in a recession phase, housing prices go down.

The period between 2003 and 2007 the economy experienced an expansion period which is represented in the increase of the S&P 500 and in the increase of the housing prices. When the actual financial and economic crisis started, the S&P500 and all the indexes in the world fell, and the housing prices too.

This proves that there is a positive correlation between the real state market and the stocks, and both are pro cyclical. The reason why there is a positive correlation explained from the point of view of economics and using macro is the following: When there is a recession period, the demand of houses decreases as people have less available money, and also other types of consumption reduce and companies have less income. This is translated in a downward movement of the market who start to decrease day by day. Due to the overall economic consequences that come from this depression the housing demand decreases and as people start defaulting and stop paying their mortgages, banks increase their supply of properties.

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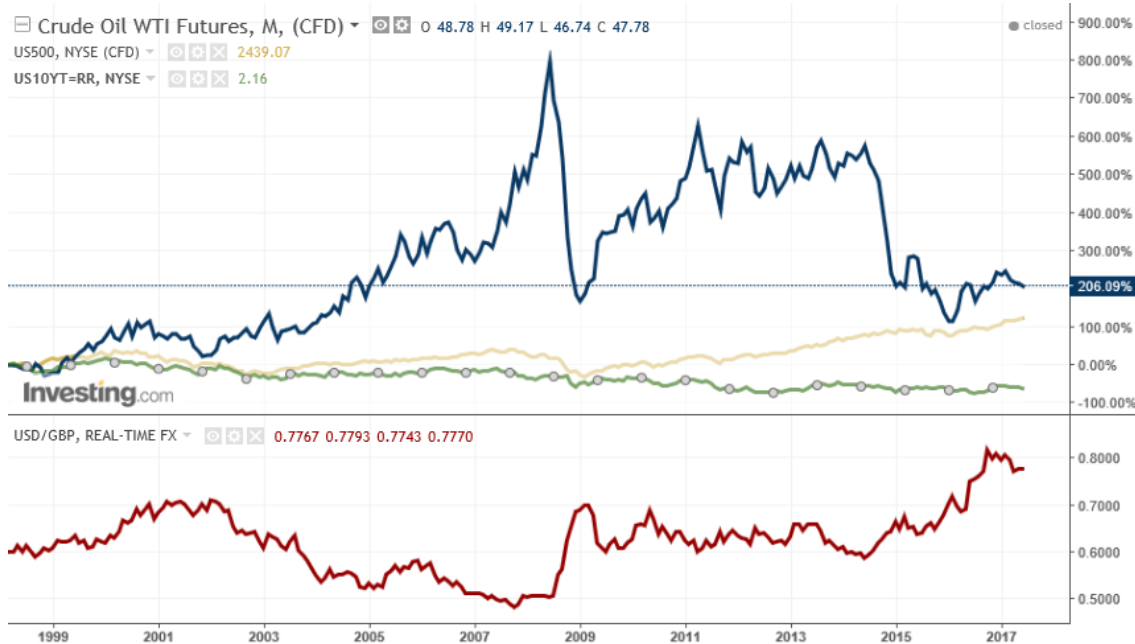
As the macroeconomic theory shows, an increase of the supply and a decrease of the demand have as an ending the lowering of prices and that is why when the economy is slowing down the price of all goods, including properties, decreases and therefore the depression is reflected in the stock markets. This would be the reason why there is a positive correlation on these two assets.

Keeping up with this theory it is true that there are lots of investors who take an advantage of the situation and, for example in a country like Spain, some of them in recessions start to buy properties, because their price is really low and they know that as time passes the value of the property will increase, and moreover they will be able to earn some money by the renting of these properties.

7.5. FINAL ANALYSIS

In the following paragraphs I'm going to include a graph summarizing the four major assets that I have analyzed individually before in order to see if there is correlation among the rest of them.

As I have just analyzed the correlation of bonds, currencies or exchange rates and commodities with stocks, as the second one is one of the most common assets in which people invest, and also because at a first glance is the one which has the higher volatility.



Graph 10. Summary evolution on a year basis of stocks, bonds, currencies and commodities

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In the previous graph we can see represented the indexes that we have chosen along the whole analysis in the paper. These are: the USD/GBP, the evolution of the price of the crude, the S&P500 and the 10 year treasury bond of the United States.

As we have been seeing, first we are going to see what the relationship between this products in an inflationary situation is and then we will see the relationships in a deflationary environment.

The intermarket relationships depend on inflation and deflation. When there is an inflationary period, or in other words when there is typically an expansion situation (sometimes there is a high inflation in some countries but it can be due to external factors rather than if the economy of the country is experiencing a constant a stable growth) period.

- There is a positive correlation or relationship between bonds and stocks. Bonds usually change their trend before the stocks.
- On the other hand there is a negative correlation or inverse relationship between commodities and bonds.
- There is a negative correlation or inverse relation between the US dollar and commodities

When we mention that two assets have an inverse relationship we are saying that when one goes the other asset will go down.

On the other hand when there is a deflationary situation, where prices are decreasing to a negative level the relationship that exists between these four major assets is:

- There is an inverse or negative relationship between bonds and stocks
- There is a negative correlation between commodities and bonds
- There is a positive relation between commodities and stocks
- There is an inverse or negative correlation between the US dollar and commodities.

7.6. DIVERSIFYING AND HEDGING STRATEGIES

7.6.1. Diversifying

The correlation between assets is not just a statistical measurement. If we think about the meaning of what the correlation represents we can reach a conclusion about where do investors put their money depending on the economic situation. Diversifying it is, somehow, related also to the economic cycle, as if the economy was always constant and stable, there won't be any risk and therefore, investors won't have to diversify their portfolios in order to minimize the risk.

Before concluding the paper by answering at the questions that have been mentioned in the initial paragraphs of this paper, let's see how really people invest. Investors do not put their money in just one type of asset and in one index, this is, an investor with 100 \$ won't put the 100 \$ in Apple for example, as that will reduce the profitability of his portfolio and increase the risk.

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Diversifying when investing is recommended, and moreover, it has benefits to the investor. If you put your money in different types of assets, this won't ensure the gain or profit but it will minimize the volatility of it. This is that the risk of the investment, when diversified is lower. Not only is important to invest in different assets but also in different sector. Even if you invest all your money in fix and variable income but only in banks, the diversification effect won't be very notorious.

On the other hand, if you invest in different assets, sectors and also in other countries the diversification effect will be much greater and that means that the risk of losing all the money or a big quantity of it is lower.

When investors and portfolio managers decide to put their money in the market they usually go over four types of assets. We have already spoken about most of them and they are:

- Stocks which are the most aggressive and volatile products of the portfolio, as we have seen in the previous chapters their evolution is constant and it can change in any second.
- Bonds which are less volatile and act like a cushion against those unexpected changes in the stock market.
- Short term investments in which we can find the money markets investments which are more conservative and try to maintain the value of your portfolio
- International stocks and bonds. As we have said it is also important, when investing, to take into account the possibility of investing abroad.

The question is, why is the diversifying concept important for this paper? It has been studied or analyzed the correlation between the four major classes of assets. This provides us with information about the growth and decrease of the values and returns of the different products. As how the theory of demand and supply says, when there is a lot of demand of a scarce good the price grows and when there is a lot of supply of this good the price tends to drop.

The same happens in the markets. When there is a lot of demand and investment in one class of assets, for example a stock, the price tends to rise and that is when the market is bullish. On the other hand, when a change of the primary trend is decreasing or maybe just there is a correction in the market investors' start selling the different products and prices drop. While they are doing this sometimes for example if we look at bonds they start buying more bonds as they feel that this asset is much more secure during recessions, where stocks are much more volatile. In this case, we would have seen that the correlation between this two assets is negative even when the investors diversifies.

It is not a concept that has to be independent of correlation.

7.6.2. Hedging strategies

As we have already said, it is important to know how the different assets work in order to make a better investment. Hedging has not a lot to do with correlation, but I thought it was interesting to at least dedicate a few paragraphs to this concept. The reason is that, even though the purpose of this paper is to analyze the correlation between assets, that will give us a clue to know where people decide to put their money, it is known that there are some kind of products that you can use in order to protect your investment.

On the other hand I think that hedging is interesting for this paper, because it is also related somehow with the economic situation of the country and the situation of the markets. As we will explain later, when investors predict that there are going to be changes in the market they tend to use this kind of products in order to cover the risk associated to the market.

This is known as hedging strategies. There are various types of products that we can use in order to hedge a position. The most common are Futures and options.

When we use short or long hedges we are protecting ourselves of the risk not only of the asset but also of the market.

When we use a short hedge we are covering our positions with a future. Investors use this when they acquire a stock and they want to sell it in the future but due to the economic situation for example, they know that is going to drop so they fix now a price at which they are going to sell the asset in the future.

On the other hand when hedging long your position, if investors want a stock but they know that they are going to buy it in the future but they have watched the market and they know that the price is going to rise, they set a price now through a futures contract in order to cover the risk of the increase on price.

There are another products that investors use in order to cover their positions. These are the options. As we have defined at the beginning this is a financial instrument that gives the one who holds it the right, but not the obligation to buy or sell the underlying asset associated to the option. There are two types of options: the call and the put, and depending on the position taken, long or short, the condition is different. When you take a long position you are buying and when you are short you are selling.

Options have some potential benefits:

- You can protect the assets in which you have investment for unexpected changes in market price. For example with stocks.
- You can increase your income in relation with the current one you are holding
- With options you can buy an asset by a lower price or sell it at a higher price
- You are secured against big market movements
- You can benefit from a change in the asset price without incurring the cost of buying the asset

Options are a kind of financial instrument that can be used not only by itself, but also you can mix some options in order to get a better hedging strategy.

So, as we have seen futures and options are very similar financial products that investors can use in their investments.

8. CONCLUSIONS

During the whole paper we have been able to analyze different things. The first one, we have analyzed what an economic cycle is, and what are the effects and the main variables for each one. We have been able to see the differences between what happens in a healthy economy with a constant and sustainable growth, but also we have had the opportunity to learn which are the signs and the effects of a depression.

After that, we have studied the different type of markets that are in the financial world. In each one we have presented the assets with which we were going, in the following chapters, to study. While studying each asset individually we have learnt how to do they work and their main characteristics, which will be crucial in order to understand later the relationships with other assets.

Once we have been able to learn the basic things in a theoretical way, the following step was to apply all that theory in analyzing different graphs which represented the performance of various assets and macroeconomic variables. While analyzing the relationship between different assets in a 10 year frame, we have seen that this relation is not always certain and equal in the whole cycle. Moreover, depending on the situation, and surely depending on external factors, the relationship between two assets might change.

One of the aims of this paper was to try investigate where people invest depending on the economic situation that the country and the globe are living. After reading some papers, reports and notes from different institutions and universities I would say that there is not a pattern. We have also introduced the concept of diversification and hedging because some investors also include does kind of investments in their portfolios, but is not that common among individuals though.

Even though there is not a clear pattern, I have noticed that during recession investors tend to invest a higher quantity of their money available for this purpose in less risky assets.

The reason is that when markets are volatile investors do not trust the riskier assets and, also depending on their risk profile, they tend to feel more secure in assets like fixed income or commodities. There is a small portion of investors that play the trend. This is, when the market is down they buy and when the market is high they sell.

On the other hand during expansion phases and recovery stages, investors feel less fearless and they start investing in assets like stocks, as they have the expectation that they will grow. The reason is that when they see that the economy is growing and recovering from a depression all the agents in the economy like companies feel more confident and they start investing, what gives them in return a growth in their income and benefits, which will make investors trust and invest.

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There is another thing that it has been shown during this paper, and it's that all markets are such interconnected and so dependent between them, on a positive or negative way, that the risk of a recession is greater. The reason is that even though if one of the markets grows while the other falls, the feeling that remains inside the investors is of fear, and this makes the machinery of investment to stop, and that will be like a vicious circle. One of the most important things in order to make the markets grow in a stable and constant way is the equilibrium that has to be inside the markets and also inside all the relationships between the economic agents, which are finally the ones who decide to invest and also where to invest.

The economy and the way of investing, producing, selling is changing quickly and markets and investors will have to adapt their strategies to the new ways of trading.

Finally, it is basic to be informed about the current market situation by reading the latest news, been aware of the expectations reflected in the different documents developed by central banks, agencies and governments. But, also, on the other hand, is important to take into account the historical data that shows the behavior of the different assets in the past, as they will act in a pretty similar way during the same situation.

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