

Department of Business and Management

Chair of Structured Finance

“The impact of QE on Corporate Investment
Strategy”

SUPERVISOR

Riccardo Bruno

CANDIDATE

Davide Vincenti

(ID687961)

COSUPERVISOR

Luigi Gubitosi

Academic Year 2017-2018

Acknowledgments

Thanks to Professor Bruno for giving me the possibility to do this paper and for giving his support during the process of redacting.

Thanks to my family for always giving me the support to move forward and for giving me all the love and the affection that only a family could give.

Thanks to my friends, who support me every day in the good and bad luck.

Thanks to the friends who are gone, because, despite all, they helped me to grow up.

Finally, I want to dedicate this thesis to my member's family who there are no more, in the hope to make them proud of me, up there.

INDEX

<u>Introduction</u>	pag. 5
1. <u>Central Banks, Monetary policies, Main Goals</u>	pag. 7
1.1 Strategies and Transmission of Monetary Policies	pag. 9
1.1.2 The Keynesian view	pag. 13
1.1.3 The Credit channel	pag. 15
1.2 The Quantitative Easing by Fed in US	pag. 17
1.2.1 QE first program	pag. 17
1.2.2 QE second program	pag. 18
1.2.3 Operational Twist	pag. 19
1.2.4 QE third program	pag. 19
1.2.5 Tapering of QE	pag. 20
1.3 The bases of QE	pag. 21
1.3.1 Federal Reserve balance sheet	pag. 23
1.3.2 The meaning of QE	pag. 24
1.4 Transmission Mechanism of QE	pag. 25
1.4.1 Bond Yield	pag. 28
1.4.2 The composition of Yield Curve	pag. 28
1.4.3 Portfolio Rebalancing channel	pag. 29
1.4.4 Signalling channel	pag. 31
1.4.5 Liquidity Channel	pag. 33
1.4.6 Confidence channel	pag. 34
1.4.6.1 The correlation between Market and Confidence	pag. 34
1.4.7 Bank Lending channel	pag. 37
1.4.7.1. QE and Bank Lending channel	pag. 40
1.5 Nominal Spending from the change in Asset Prices	pag. 43
1.5.1 Cost of Borrowing	pag. 43
1.5.2 Wealth Effects	pag. 44
1.6 Corporate Bond	pag. 45
1.6.1 Comparative studies on corporate bond's yield in QE	pag. 45
1.6.2 The effect of QE on corporate bond's yield	pag. 46
1.7 Connection between stock market and investor's confidence	pag. 50
1.7.1 Investors and Consumers Confidence	pag. 51
1.7.2 QE effect on stock market, comparative studies	pag. 53

1.7.3 Stock market, QE's effect	pag. 54
1.8 QE impact on Firm Financing	pag. 58
1.8.1 Data Related to the Long-Term Debt and MEP	pag. 58
1.8.2 Regression Results	pag. 60
1.8.3 External Financing	pag. 62
1.8.4 Conclusion	pag. 63
2. <u>M&A, Cap. Expenditures, Buybacks</u>	pag. 64
2.1 Merger & Acquisition	pag. 65
2.1.1 History of M&A	pag. 65
2.1.2 Merger and Acquisition, What and Why	pag. 67
2.1.3 The M&A market pre-crisis	pag. 70
2.1.4 The M&A market post-crisis	pag. 72
2.1.4.1 The M&A market in 2012, World and USA	pag. 74
2.1.4.2 The M&A market in 2013, World and USA	pag. 79
2.1.4.3 The M&A market in 2014, World and USA	pag. 84
2.1.4.4 The M&A market in 2015, World and USA	pag. 88
2.2 Capital Expenditures	pag. 94
2.3 Shares Buyback	pag. 96
3. <u>Quantitative Analysis of M&A, Capex and Buybacks</u>	pag. 98
3.1 The macroeconomic & Index analysis	pag. 99
3.2 Sector description and relative Index analysis	pag. 104
3.3 Numerical Analysis of Firm's Investment	pag. 112
3.3.1 Communication Services Firms Analysis	pag. 113
3.3.2 Information Technology Firms Analysis	pag. 115
3.3.3 Industrial Firms Analysis	pag. 118
3.3.4 Final Average Results	pag. 120
<u>Conclusion</u>	pag. 122
<u>Bibliography</u>	pag. 125
<u>Sitography</u>	pag. 128
<u>Index Graphs</u>	pag. 129
<u>Index Tables</u>	pag. 133

Introduction

“The collapse of Lehman Brothers in September 2008 initiated an unprecedented global financial crisis bringing out one of the most virulent recessions in decades”¹, only the crisis of 1929 can be considered maybe worst compared to 2008.

The crisis was unexpected and the firms didn't have a plan in order to respond to it, a lot of companies went in bankruptcy because the banks, which were in trouble due to the usage of derivatives and of the well-known subprime-loans, wanted back the money that they give so “easily” before September. This led to a “Liquidity Crunch” which paralyzed the market.

In this context, the United States central bank, Fed, and the European one, Bce, started programmes for “re-giving” liquidity to the market to get out, as soon as possible, from the crisis. These plans provided financing rates at the historical minimum, to 0%, with the purpose of giving liquidity to the banks which needed it. All of these in the hope that banks, seen the low rates, didn't cut the liquidity to firms and privates.

The crisis and the behaviour of the banks led to a contraction of the firm's investments, seen the deficiency of liquidity and the fear that the crisis brought in the mind of people in 2008. After the programmes of central banks the cost of debt went down and the firms found a new way for investing thanks also to the positive macroeconomic trend (the positive trend started in 2011 and it is still going on) which led the firms in 2018 at higher profits than pre-crisis period.

The purpose of this paper is to understand with empirical data, how the firm's investments change after the crisis. We are going to analyse the pre-crisis period, 2003-2006, and the post-crisis period, 2012-2015, for seeing if despite the exit from the crisis and the change of debt's cost related to the high liquidity (due to the Fed programmes), something has changed or not in the way of investing.

¹ OECD, 2009a. OECD Economic Outlook, 2(86), OECD, Paris.

In the first chapter, we are going to analyse: the programmes of central banks after the crisis, the measures and transmission of monetary policy, why Fed needs unconventional tools, the cost, and the consequences of these aggressive monetary policies. In order to understand better the low cost of debt after the crisis and if this change the firm's investment policies.

In the second chapter, we analyse the type of investments: the external investments translated in acquisition investments (M&A), the internal ones translated in Capital Expenditures and the Buybacks (returns to shareholders).

In the last chapter, we pick the data of 34 firms of Industrial Sector and 32 from the Information Technology & Communication Services sectors (19 from the first one and 13 from the second one) to analyse: the capital expenditure, regard the internal investments, the M&A activity, regard the external investment, and the buybacks, regard the return to the shareholders.

All these data related to the 2012-2015 period in order to compare them after with 2003-2006 period in order to understand if there was a real change in the way of investing or not.

Chapter 1: Central Banks, Monetary policies, Main Goals

The idea of the independence of central bank is fundamental for the market, because it guarantee that despite the democratic or republican government the goal is to improve as possible the economy of the country and the wealth of the citizens.

In 1962 Friedman already analysed the situation related to the independence of central banks in his paper “Should there be an independent monetary authority”² in which he wrote that only with independence from politics is possible to obtain a stable monetary system with fixed rules and a specific macroeconomic objective that must be “super-partes”.

The Federal Reserve has a high level of autonomy in fact the United States Congress and the President don't have to approve the policy and the tools applied by Fed to achieve its purpose. Despite the autonomy of the Fed, it must follow the law made by the government, this is way the Fed and the Congress, which can change the law, must communicate between themselves.

The central bank's goal is the price stability with a stable and low inflation, without it, an economic growth it's impossible, because the market wants a stable and predictable future without uncertainty. The worst scenario ever is the case of hyperinflation, which makes serious damage to the economy of the country. Today one of the worst case of hyperinflation is Venezuelan one, where the estimated inflation for the end of the year is equal to 1000000%!³.

To achieve the goal a central bank normally uses nominal anchor like the inflation rate or the money supply. The usage of this tools permits to tie down the inflation expectation and provide for an expected constraint, solving the problem of time-inconsistency.

Another goal of the central bank is high employment, it's impossible an unemployment equal to zero therefore we must think about the relation between the demand of labour and the supply of labour, which should be matched as well as possible (This is not a direct goal of monetary policies because the purpose of the monetary policies is to encourage firm to invest and people to spending, and not the full-employment).

² M. Friedman (1962), “In search of a monetary constitution”, Yeager.

³ Milano Finanza 24/07/2018, [milanofinanza.it/news/entro-il-2018-in-venezuela-inflazione-a-un-milione-percento-201807242046294290](https://www.milanofinanza.it/news/entro-il-2018-in-venezuela-inflazione-a-un-milione-percento-201807242046294290)

Other goals are the interest rate stability but also the financial market stability in order to avoid the possibility of another crisis. The last indirect goal is the stabilization of the foreign exchange market by the central bank.

When we speak about all this goal, we must remember that each behaviour of central banks differs each other, this because every bank (or state) has its own objective. In fact, we can find two main categories of central bank: first the ones with one mandate and one goal, the price stability, second the ones with two mandate and two goal, the price stability and high employment. In the first group, there is the Bce while the Fed belongs to the second group.

1.1: Strategies and Transmission of Monetary Policies

There are two main strategies that can be chosen by central banks: the monetary targeting and the inflation targeting. The first were very used around 1970 while the second is used nowadays (The first one is no more used, like in the past, so we are going to analyse only the second one, the inflation targeting).

In the case of inflation targeting the central bank define an inflation rate target and the objective is to maintain that rate as close as possible to the pre-established number. When the central bank fixed the objective it also decided and announce which is the time-horizon within it intend to reach it. Usually the disclosure of this information and relatives change are done in a public press in order to inform as well as possible the public.

If we assume t =today and T the time horizon the “Fisher Equation” will be:

$$i_t - i_{t-1} = y (\pi^e_{t+T} - \hat{\pi})$$

The central bank must control every time the differential between the actual inflation and the pre-established inflation target. If there is still a difference it has to change its action and so change the interest rate. Keep in mind that all this actions are made for the long-term goal of the central bank that is the price stability.

When this method (inflation targeting) was adopted, there was a significant improvement of inflation stability (and so price stability). The first nation who used this method was New Zealand in 1990, also Canada (1991) and UK (1992) adopted this method too. The inflation rate in all the mentioned nations change from an average of 15-20% to an average of 1-4% of the last decades!

The first advantage of this regime is that; it helps clarifying and achieving the pre-established long-run goal thanks to the reduction of time-consistency problem. The second one is the increase in transparency due to the regularly communications with the market;

the publication of documents regarding the monetary policy, the goals, and the strategies applied to achieve that result; at least the possible change to the target (during the time-horizon of the strategy).

There are also other benefits like the improvement of performance, the increase of accountability and of uniformity with democratic principles.

On the other hand, there are some disadvantages as the problem of lag, which determines the difficulty of inflation's monitoring, or the rigidity of the rules to follow; but in this model, there aren't only mechanical instruction but also the analysis of several variables that we must consider to choose the right strategy for our goal.

Whatever is the strategy used by central banks, it needs tools to control the money supply and to maintain the stability of the price; of course, these are different, the ones used by Fed are not the same used by European central banks. Now we are going to explain the second ones before the Fed tools.

In "no-crisis" period the central banks, in this case Ecb, uses three main instruments for monetary policy: open market operation, discount lending and reserve requirements (these instruments are considered "normal" measures of conventional monetary policy tools). All the central banks use those tools, now we are going to explain how they uses those instruments in their policies.

The first instrument we are going to analyse is the open market operation. This instrument is very simple, the Ecb gives monetary base in exchange of financial instruments of a normal bank. The aim is giving the liquidity to the bank which needs it. There are four main kind of operation which are different in procedures and objectives:

1. MRO: main refinancing operations.

One of the most important operation; it is a weekly reverse transaction in which Ecb gives liquidity to the Eurozone banks, which has to pay interests and give appropriate financial activities as collateral.

2. LTRO: longer term refinancing operations.

Reverse transaction liquidity-providing which differ for the timing compare to the one already described. This operation has three months' maturity and it carried out monthly. The aim of it is to give more stability to the system.

3. FTO: fine tuning operations

Operation uses to manage liquidity and manoeuvre interest rates. It can be an exchange swap or a reverse transaction; but basically, these are extraordinary operations, which are faster and more flexible compare the previous ones.

4. Structural operation.

This type of operation can be a reverse transaction, an outright one or an issuance of debt certificates. This operation is complex and the aim is to change the long-term position of the banks, respect the liquidity in circulation.

The second instrument is the discount lending (discount rate). The Eurosystem gives to the institutions two opportunities that are called “standing facility”.

1. Marginal lending facility.

The bank, which suffer a deficit of liquidity reserves can always ask, if it has the appropriate collateral, for an overnight loan from ECB; of course, the interest rate will be higher compare to the regular one.

2. Deposit facility.

Each bank of the system can make overnight deposit with central bank; of course, the interest rate will be lower compare to the refinancing one, because the bank knows of getting back money without costs.

The third instrument is reserve requirements. The aim of those operations is the stabilization of the interest rates in the money market and the creation of a structural liquidity shortage.

This reserve requirement depends on the average daily reserve owned by an institution during a maintenance period, which takes in to account all the elements of the balance sheet and the application of different coefficient. All the financial institution, which owned the reserve requirements, can access to the standing leading facilities and be into the open market operations.

On the other side of the Atlantic Ocean there is another central bank, the Federal Reserve, which uses different tools compare to Ecb ones; but with same aim on the market.

The short-term objective for open market operations is specified by the Federal Open Market Committee (FOMC). These are conducted by the Trading Desk at the Federal Reserve Bank of New York⁴. The kind of securities, which can be bought by Fed, are of course limited (the section 14 of Federal Reserve Act contain the list of the limited securities).

Open market operations are divided in two macro-categories: temporary and permanent. Let's gone to look better these kinds of operations more in detailed.

1. Temporary.

This type of operations are typically to address reserve needs that are deemed to be transitory in nature⁵. There are two main kind of operation: repurchase agreements (repos) and the reverse repurchase agreements (reverse repos). The first ones are like collateralized loans by federal reserve, in which the interest is the difference between the purchase and sale prices. The second ones are like collateralized borrowing by Fed, in which the security, sold by the Trading Desk will be repurchased in the future. This last tool (overnight reverse repo) helps keeping keep the federal funds rate in the target range established by the Federal Open Market Committee⁶.

2. Permanent.

These operations consist in outright purchases or sales of securities for the System Open Market Account (Soma), the portfolio of Federal Reserve. Normally, this type of instrument is used to accommodate the longer-term factors driving the expansion of the Federal Reserve's balance sheet⁷. After 2008 permanent open market operations were used to adjust Fed's holdings of securities for two reason: to put downward pressure on longer-term interest rates and to create better financial conditions for the market. Post-crisis those are used to implement the FOMC's policies of reinvesting principal payments from its holdings of agency debt and mortgage-backed securities (MBS) in agency MBS and of rolling over maturing Treasury securities at auction⁸.

All the permanent and temporary operations are published on the website of Federal Reserve Bank of New York. Each of these operations have an impact on Fed's balance sheet, which depends on the size and nature of the operations.

⁴ Federal Reseve Official Site, [federalreserve.gov/monetarypolicy/bst_openmarketops.htm](https://www.federalreserve.gov/monetarypolicy/bst_openmarketops.htm)

⁵ Ibid.

⁶ Ibid.

⁷ Ibid.

⁸ Ibid.

1.1.2: The Keynesian view

In the Keynesian model the interest rate was, for more than 50 years, the key monetary transmission mechanism. We can resume the real economy effect of a monetary contraction in this schematic diagram:

$$M \downarrow \Rightarrow i \uparrow \Rightarrow I \downarrow \Rightarrow Y \downarrow$$

If we contract the monetary policy ($M \downarrow$), the interest rate goes up ($i \uparrow$), which lead to a rise in the cost of capital with the consequence of a reduction in investment spending ($I \downarrow$) and finally to a decrease in the output ($Y \downarrow$).

When Keynes outline this view, the investment spending was affected only by business's decisions, only later other economists have decided to include also consumer's spending (like in housing or durable expenditure) inside it.

The decline of the investment in this model, per Taylor (who implemented this model), is caused by the strong correlation between the increase in the short-term interest rate and the long-term one, which because of sticky prices and rational expectations goes up as well. Other economists argue about the importance of another mechanism, the credit channel, this because they think that the position delineate by Keynes before and Taylor after is controversial.

The transmission mechanism doesn't include only the interest rate or credit channel but also the exchange rate channel, this is very important due to the internationalization and integration of western economies. If national interest rate goes up ($i \uparrow$) the domestic deposits become more attractive, this lead to an appreciation of the domestic value ($E \uparrow$) which cause a decrease of net export ($NX \downarrow$) and successively a decline in the aggregate output ($Y \downarrow$).

$$M \downarrow \Rightarrow i \uparrow \Rightarrow E \uparrow \Rightarrow NX \downarrow \Rightarrow Y \downarrow$$

In the transmission, there are more and more variables than the only three we have discussed before (the two interest rates and the exchange rate), in fact the monetarists take into account

also the relative asset prices and real wealth. Those leads to two theories: the Tobin's q theory of investment and how wealth affect consumption.

In the first one the valuation of equities is the main point, where the q is the result of the division between the market value and the replacement of cost of capital (the number will be high if the market price of companies is high compare to the replacement of capital's cost). New capital expenditures are affordable related to the market value of business firm. An issue of equity lead to a higher market price and so the company is able to do new investment. Instead if the q is small and the company wants new capital, it can be acquired in order to get the old capital to raise the q (if there is this second case the investment spending will be flat).

So now we are going to discuss how the monetary policies affect equity prices (P_e).

$$M \downarrow \Rightarrow P_e \downarrow \Rightarrow q \downarrow \Rightarrow I \downarrow \Rightarrow Y \downarrow$$

If the money supply goes down the public react because they think to have less money than before. For this reason, the consumption goes down, this lead to a decrease of expenses on the stock market, which causing the fall of equity prices and relative asset prices.

In the second thesis, we have to refer to Modigliani life cycle model, in which he described the consumer spending as the aggregation of human and real capital and financial wealth; this because the consumption is, through equity prices, another one monetary transmission channel, which is affected by wealth.

$$M \downarrow \Rightarrow P_e \downarrow \Rightarrow \text{wealth} \downarrow \Rightarrow \text{consumption} \downarrow \Rightarrow Y \downarrow$$

When stock's prices (P_e) go down the wealth and the consumption (we explained in the previous paragraph the correlation) followed the same destiny, this finally lead to a decrease of aggregate output.

1.1.3 The credit channel

We have described before the interest rate and asset price channel, but those methods don't explain well all the real consequences of monetary transmission. The credit channel method try to change the view with a new explanation, even if this can't be considered independent or as a parallel channel. Bernanke and Gertler, in their paper "Inside the Black Box", described how the credit channel generate and increase conventional interest rate effect and which is its role inside the monetary transmission system, also called "Black Box".

They used an auto regression analysis for showing the consequences of a tightened monetary policy and they identify four main aspects:

- i. a money supply's contraction causes a permanent decrease of GDP and price levels, those in the long-term, while in the short-term there is a transitory effect on the interest rates;
- ii. the final demand goes down, while inventories rises in the short-term but they fall in the long-term;
- iii. the fall of final demand depend largely on the decrease of durable expenditure's purchase and of residential investment;
- iv. also, the fixed business investments fall but not as much as the durable expenditure or the residential investments.

It's clear that the interest rate channel or the credit channel or both cannot explain perfectly the consequences, of the unusual monetary policies adopted to get out from the crisis, on the real economy.

One of the main problem during the monetary policy shock, referred to the interest rates, is the asymmetric information which causes some contrasts and collisions on the financial market.

This lead to an external finance premium, between the lender and the borrower, related to the sunk costs which arise from the common principal-agent problem.

There are two channel which explain the principal-agent problem in the credit markets, the first one is the bank credit channel while the second is the balance sheet channel.

- The bank credit channel: the bank is a financial institution with an important role in the financial market. Thanks to the instrument it has, it is able to lend money to private or small firms, situations where there is asymmetric information. The large company doesn't need a bank because it can go directly on the market (the market will make the price and the interest); while a monetary contraction from the central bank start a downward chain effect, related to small firms and private, because there is a drop of bank deposit first, after of bank loans which cause the decline of investment and of final output.

$$M \downarrow \Leftrightarrow \textit{bank deposit} \downarrow \Leftrightarrow \textit{bank loans} \downarrow \Leftrightarrow I \downarrow \Leftrightarrow Y \downarrow$$

- The balance sheet channel: the second channel works through the business firm's net worth.

If it goes down the firm has several losses related to adverse selection problem because it has less collateral to take loans; but also, related to the moral hazard problem because a firm has surely investment projects in the pipeline and if the net worth decreases it will not be able to have the same amount of investment like before the fall in lending.

$$M \downarrow \Leftrightarrow P_e \downarrow \Leftrightarrow \textit{adverse selection \& moral hazard} \uparrow \Leftrightarrow \textit{lending} \downarrow \Leftrightarrow I \downarrow \Leftrightarrow Y \downarrow$$

This reduction of financing sources lead to a decrease of firm's investment spending and causes also a decrease in cash flow with the well-known effects.

$$M \downarrow \Leftrightarrow i \uparrow \Leftrightarrow \textit{cash flow} \downarrow \Leftrightarrow \textit{adverse selection \& moral hazard} \uparrow \Leftrightarrow \textit{lending} \downarrow \Leftrightarrow I \downarrow \Leftrightarrow Y \downarrow$$

After the technological innovation of last years, the bank's role in the financial market is less important year by year, related to banking lending channel; while the balance sheet channel is gaining more importance through years.

1.2 The Quantitative Easing by Fed in US

The Federal Reserve objective is the decrease of long-term interest rates; this is the reason of the large asset's purchase by Fed after the crisis. It bought a large quantity of bonds which change the Fed's balance sheet activities, this is the point where we start to analyse the QE, to understand better how it impacts the cost of debt e successively the firm's investment strategy. After the 2008's crisis the Fed has a principal role on the market because instead of change only the funds rate it become part of the market by the large purchase strategy.

1.2.1 QE First Program

The Fed on 25 November 2008 started the first quantitative easing program, this consist in a large asset purchase program. The assets bought by Fed were, direct obligation of housing related government sponsored enterprises and the well-known mortgage backed securities.

The first category was financial service corporation owned by Fed with the objective of improving the credit flow, the efficiency on the market, related to specific sectors, and to reducing the risk to the shareholder on the capital market. The GSEs took all the mortgages from secondary market and sold them to the institutional investors on the open market as MBSs⁹. All of this for giving liquidity for house purchase on the real estate market and for reducing the mortgage interest rates. Targeting the housing and credit market was sensible as they were particularly shaken by the fall in US real estate prices, sales and construction¹⁰.

The first program consisted in a purchase of 100 billions of direct obligations and of 500 billions of agency-backed mortgage backed securities, without specifying for how many quarters it will be applied. Instead of go out from the crisis, the economy continued to be in recession. This is why the program became of 1,25 trillions of MBS's purchases and 200 billions of GSE's debt¹¹ (this to give the liquidity needed to support the mortgage's lending and real estate market).

⁹ Federal Reserve Official Report, 2008

¹⁰ Four stories of Quantitative Easing, Fawley & Neely, Federal Reserve Bank St. Louis (2013)

¹¹ Federal Reserve Official Report 2010

While to support the credit market, the federal reserve start to purchase 300 billions of medium-term treasury securities over next six months. Federal Reserve wanted to keep under control the price stability and promote the economic recovery; they believed that rates would be higher than inflation rate and it would lead to a price stability and to an economic growth in the long-term, this thanks to the stall of the domestic and foreign economies.

On 31 March 2010, the program was expired because the Federal Reserve saw a financial market condition's improvements. The fund rate was improved in a range between 0%-0,25% because the outlook of labour and financial market was positive, despite the moderate recovery expected.

1.2.2 QE Second Program

The Fed on 3 November 2010 disclosed the second program of quantitative easing, the reason of this second one were the low inflation, the high level of unemployed people and the troubles, during the second half of 2010, in the financial market. Real activity remained sluggish with a disinflationary trend in the US¹².

The aim of this QE "2" was to give a boost to economic recovery, to rise up inflation's level and to keep its current policy of reinvesting principal payments from its security holdings in long term treasury bonds and maintain a face value of 2,045 trillion¹³.

By the second quarter's end of 2011 the FOMC declared its intention for purchasing 600 billions of long-term treasury bonds, the program was set up to a rhythm of 75 billions per month and the FOMC decided to review constantly the pace of the program and the total size of it. The fund rate was kept in the range between 0%-0,25%, as before.

The QE program has generated much controversy; but the QE "2" has been very criticized, because several economists, as Swanson, Reichlin or Wright, were warned about the program and specifically they thought that it won't be able to improve the economic conditions. Furthermore, they believe that this program could lead to a currency risk, an inflation rate risk and at least to a more troubles in the financial market.

¹² Four stories of Quantitative Easing, Fawley & Neely, Federal Reserve Bank St. Louis (2013)

¹³ The ins and outs of LSAP's. Krishnamurthy & Vissing-Jorgensen Federal Reserve Bank, 2011

1.2.3 Operational Twist

On 21 September 2011, the Federal Reserve announced a maturity extension program, also known as Operational Twist. During the QE”2” ‘s end the Fed understand that the program didn’t give the right results on the real economy growth, which remain slow. While the recovery trend remained positive although slow, the Federal Reserve was worried about the unemployment rate, which decreased but not so much as expected by the Fed’s program put in place. This was not the only concern of Federal Reserve because the inflation target too, didn’t rise up as foregone and it was anticipated to settle at or below the level expected. Furthermore, the Fed disclosure a communicate in which declare its intention for extending the maturity of its holdings of securities.

The objective of that program was to maintain the short-term interest rate at the zero-bound level and to lower the long-term interest rate, without the increase of central banks’ balance sheet¹⁴. In this operation, the Fed sold the short-term treasuries and bought long-term ones; this in order to reduce the risk of adding inflationary pressure and to avoid the possibility of a decrease of long-term interest rate due to the reduction of long-term treasuries available. The program consists in a turnover of 400 billions between short-term treasuries securities (sold and with a maturity equal or less 3 years) and long-term treasuries securities (bought and with a maturity in a range between 6-30 years), regularly reviewed and in case adjusted related to the size or the composition. The target rate was kept at 0-0,25%¹⁵. The program had to be interrupted in June 2012 but the Federal Reserve extended it through the end of 2012¹⁶. These extensions expand the turnover with additional treasuries securities equal to 267 billion.

1.2.4 QE Third Program

On 13 September 2012, the Fed announced the “third” quantitative easing program, as a consequence of the not strong economy growth, of the high unemployment rate and of the inflation rate below the target of 2%.

¹⁴ A high frequency event study analysis of operation twist and its implications for QE2. Swanson, Reichlin & Wright, Brookings Institution Press (2011)

¹⁵ Federal Reserve, 2011

¹⁶ Federal Reserve, 2012b

The aim of the program was the achievement of the inflation rate target of 2% or slightly higher and as a boost for the economic growth.

The program consisted in starting to acquire 40 billion worth of agency-backed MBS per month until the achievement of a right unemployment rate level. This is one of the big difference between Q3 and Q1 & Q2. The other one is the expiration date; while the Q1 and Q2 had a certain date of ending, the Q3 or QE-Infinity had not because it has a “goal achievement” as stop. Concurrently with the operational twist the Fed increase its monthly acquisition, of long-term security holdings throughout 2012, to 85 billion. Fed’s fund rate would be kept at the 0-0,25%¹⁷. The effect combined of operational twist and Q3 was to make pressure on long term interest rate, support the real estate & mortgage market and to create better condition on financial market.

On 12 December 2012, the Fed disclosed its program of monthly purchases expansion to 45 billion worth long-term treasuries at the beginning of 2013, decided to kept the fund rate at the 0-0,25% level at least for as long as the unemployment rate exceeded 6,5%¹⁸, and the inflation rate no more than 0,5% of the 2% target¹⁹ (one to two-year outlook for inflation).

1.2.5 Tapering of Q3

On 18 December 2013, the Federal Reserve disclosed its program of starting tapering back its asset purchase program in January 2014. The program consisted in a cut of total purchases equal to 5 billion of agency-backed MBS and 5 billion of long-term treasuries securities²⁰. The Fed announced to keep down the long-term interest rate thanks to the still increasing size of its long-term securities holdings, support the real estate & mortgage market and ensure for long-term inflation target meeting with a sustained economy growth.

In 2014 the Federal Reserve saw significant improvements on the labour and financial market with a stronger growth in the broader economy, this is why the Fed disclose the program of tapering back its asset purchasing of 10 billion in March, April, June, July and September. Finally on 29 October 2014 the Federal Reserve announced the conclusion of the last program²¹.

¹⁷ Federal Reserve, 2012b

¹⁸ Ibid.

¹⁹ Ibid.

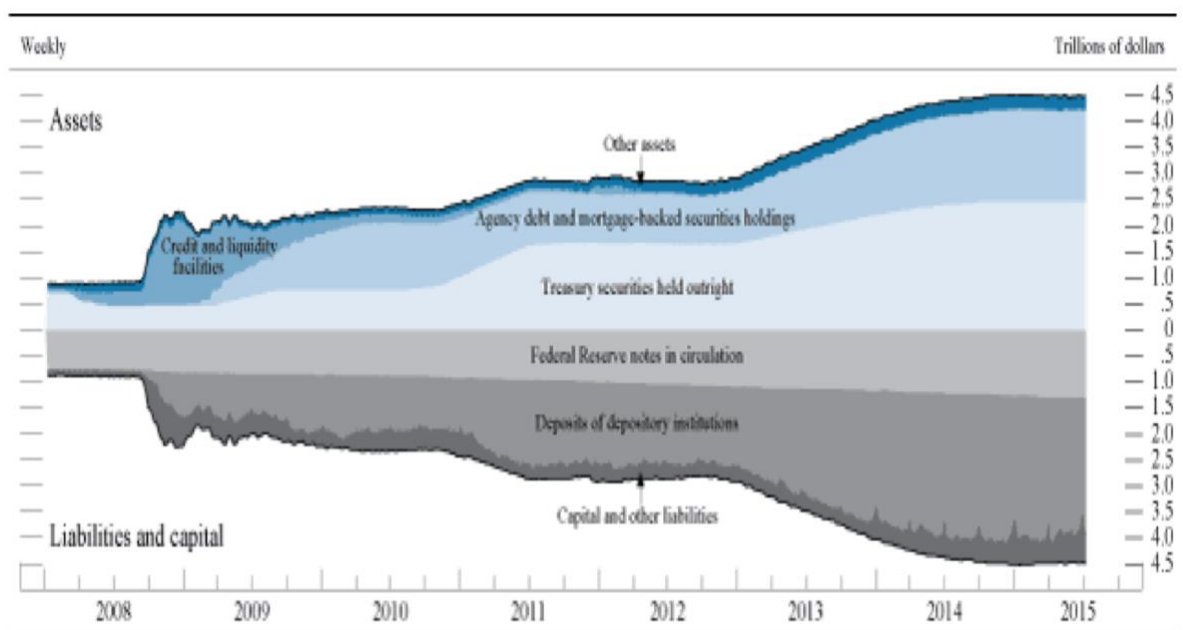
²⁰ Federal Reserve, 2013

²¹ Federal Reserve, 2014

1.3 The bases of QE

The objective of Federal Reserve was to push down the long-term interest rate with the purchasing of assets despite the change of money's price. To do that the Federal Reserve's balance sheet activities change, there were inside a large amount of bonds, this in order to be nearest as possible to the quantity of money (a closer relationship).

Graph 1: Assets and Liabilities held by Fed from 2008 to 2015.



This graph represents the assets and liabilities held by fed until 2015. It's possible to see the large increase, as we said before, in 2013; from the -3/+3 trillions of dollars of 2012 to the -4,5/+4,5 of 2015, an increase of 50%! There is no doubt of the incremental exposure of Fed from 2008, the beginning of crises, to 2015 in order to contain/resolve the worldwide financial crises.

According Borio and Disyatat (2009), there are four main forms of balance sheet policies;

1. Foreign Exchange: which impacts the private sector balance sheet on the net foreign exchange exposure.
2. Public Debt / Securities: which impacts on the composition of claims on the public sector.

3. Private Credit / Securities: which impact on the composition of claims on the private sector.
4. Bank Reserve: no specific impact.

The central bank tried to change the composition of private sector balance sheet for better financial conditions on the private market. This was possible due to the credit policy, which permitted to adopt some measures with the objective of targeting specific sector of private debt and securities.

The Fed was involved in many of possible credit policy action, Borio and Dysiata (2009). Influence interbank market; *modification of discount window facility, exceptional long-term operation, broadening of fileigible collateral, broadening of counterparties, inter central bank foreign exchange swap lines, introduction or easing of conditions for securities lending.* Influence non-bank credit market; *Cp funding/purchase/collateral eligibility, Abs funding/purchase/collateral eligibility and other securities purchase.* (There were not only credit policy actions but also quasi-debt management policy action adopted by Fed; the purchase of government bonds. Action replied also by the bank of England)

The most discussed actions during the crises were the purchase of MBS backed by GSE. These started because The federal reserve wanted to support the mortgage market directly, this kind of acquisition should be a quasi-debt management but seen the nature and the reason of purchasing these are considered as credit policy category.

Must be said that all the central banks are under individual limitation related to the securities which can be purchased. For example the Federal Reserve (under the Federal Reserve Act) cannot buy or has limit for Treasuries, MBS and agency bonds purchasing.

If on side there is the credit policy, on the other side there is the quasi-debt management which targets the financial market for public debt. The Federal Reserve started to buy a large amount of government debt with the aim of affect the yield on the long-termed treasuries (In this case the central bank is like an intermediary between the government and the private sector). In fact, as many research suggest, the yields curve change only if there is a very big amount purchase (only the central bank can do that!), and studies already done demonstrates that even a big change in the composition of private sectors holdings has a rather small effect on the yield curve.

1.3.1 Federal Reserve Balance Sheet

Table 1: Federal Reserve Balance Sheet, 2007-2009 (Source, Federal Reserve)

FEDERAL RESERVE BALANCE SHEET (billions of dollars)	<i>27/06/2007</i>	<i>30/09/2009</i>
Total Assets	869	2144
Short-term lending programs for financial institutions	0	264
Targeted lending programs	0	84
Securities holding	791	1593
Treasury securities	791	769
GSE-related securities	0	824
Emergency lending	0	101
Other assets	78	102
Total Liabilities	836	2093
Federal Reserve Notes	775	874
Reserve Balances	16	848
Treasury Deposits	4	273
Other Liabilities	41	98

This balance sheet compared the end of June 2007 (just before the beginning of the crises) to the end of September 2009. As is possible to see the total assets had a huge increase from 869 billions to 2144 billions. On the other side, there was an important increase in the reserve balance from 16 billions to 848 billions. In the asset side, more specific, the Federal Reserve provided short-term lending programs, this amount increase from 0 to 264 billions; but the most important part of it, related to the QE, is the Securities Holding or Marketable Securities amount (which consists of Treasury bonds and

Notes, agency debt, agency-backed MBS) that pass from 791 to 1593 billions. In the 2009 this amount represents the 75% of total assets held by fed.

Marketable/Securities Holdings	<i>27/06/2007</i>	<i>31/12/2008</i>	<i>30/09/2009</i>
Securities holdings	791	496	1593
Treasury holdings	791	476	769
GSE-related holdings	0	20	824

1.3.2 The meaning of QE

Nowadays is very common to use the term quantitative easing related to a not common monetary policy, but this was used already in the past.

In 2004 some economists, such as Ben Bernanke or Vincent Reinhart, already spoke about “quantitative easing” as an extraordinary instrument to set the short-term policy rate to zero when the conventional measures are no longer useful. When the media today spoke about QE, they correlate it to an expansion of narrow money, but this is not correct at all.

This term arises in Japan in the 1994, this was used to describe a needed change in the monetary policy of the country. The Bank of Japan used this “term” in 2003 after the implementation of a different monetary policy in 2001, the BoJ staff used this words but not always in a positive sense, however must be said that those words were used in a more complex lecture without a relevant importance.

In the last decades, a lot of central banks used a “quantitative easing program” but the programs have been mechanically different one from another²². The purchase of assets by a central bank is not an unusual fact, the differences in those cases of the last year is related to the amount of the purchase made and regard the economic circumstances.

The substantial difference of QE compared to a conventional monetary policy is that the first one inject a specified quantity of money in a scheduled time. The second important difference is related to the kind of purchases; in the case of QE the central bank purchase not only short-dated government securities but also long-dated ones and MBS.

For example, the QE implemented by the BoJ from 2001 to 2006 targeted the bank reserves while the Fed’s QE involved an expansion of Fed’s Balance Sheet and included also an asset side related to the “credit easing” approach (this was made for affect the credit conditions of businesses and households).

²² Four stories of Quantitative Easing, Fawley & Neely, Federal Reserve Bank St. Louis (2013)

It's not possible to say if the Boj's QE is wrong while Fed's one is correct; there were many differences in the policies which reflect the financial conditions at a specific time.

1.4 Transmission Mechanism of QE

Some economists, such as Boivin or Kiley and Mishkin in a lecture of 2010²³, distinguish two basic types of monetary transmission: neoclassical and non-neoclassical channels. The first is referred to the financial market which has to be perfect, the second one referred to financial market imperfections.

The neoclassic channels as traditional channels depend on:

- Investment: which is linked to the direct interest rate channel.
- Consumption: linked to the wealth and intertemporal substitution effects.
- International Trade: linked to the exchange rate channel.

These are the primary channels of neoclassical model with their criteria.

Non-neoclassical channels, as said for the neoclassical ones, have effects on the credit markets.

In this case there is a ineffective financial market functioning; this is caused by a series of reason as the imperfection in the private markets, the asymmetric information, the market segmentation, or the government's interferences which create the market imperfection.

There are three basic non-neoclassical channels:

- Government Regulation: if there is a change in the credit supply by the government, it will affect the credit in the market; for example a restriction on financial institution has effect on their spending.
- Bank Capital based Channel: the banks have a central role in lending, if the capital goes down this ability it's compromise.
- Balance-Sheet Channel: this is linked to the external finance premiums of firms and households which is influenced by the change of net worth connected to the asset price effects.

²³ How was the monetary transmission mechanism evolved over time? Boivin, Kiley and Mishkin, Federal Reserve Board (2010).

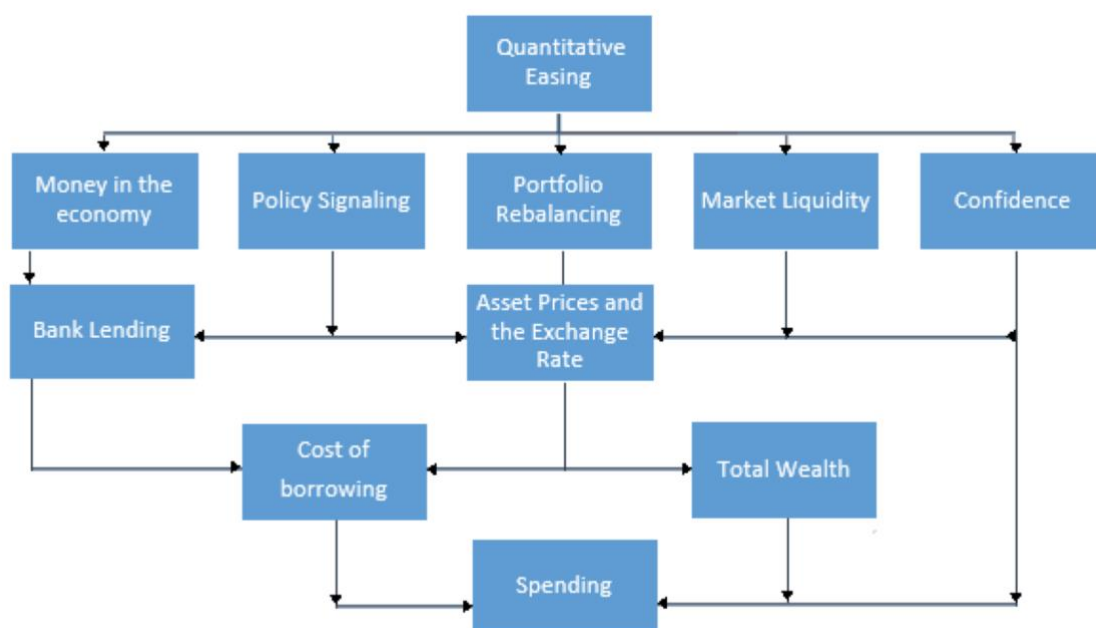
In the 1995 the economist Horngren explains the functioning of transmission mechanism with two crucial supposition²⁴.

The first assumption is the presence of an interest rate target in the monetary policy of a central bank.

In this case the Fed has the control of the overnight rate on interbank loans, it seems like a countersense respect the first assumption; but must be said that despite the Federal Funds Rate is zero, it's still Fed who has the control over the nominal interest rate (monopoly).

The second assumption is the variation of aggregate demand as a transmission due to the changes in the monetary policy. In this case if the demand outcrops the production, there will be an inflationary pressure and vice versa. This topic become more complex and sophisticated when it's put inside the expectation which affects the process.

Graph 2: Quantitative Easing Transmission Mechanism



Graph 2 represents the QE's various channel of transmission; at the beginning of the mechanism there is the purchase of asset by the Fed, after the acquisition five mechanism could potentially have effect on the various asset prices acquired.

²⁴ Monetary policy in theory and practice, Horngren, Quarterly Review (1995)

These five mechanisms are:

- Policy Signalling
- Portfolio Rebalancing
- Market Liquidity
- Confidence
- Bank Lending: which is the consequence or the result of money in the economy and policy signalling within the asset price and exchange rate change.

All the five mechanisms have impact on the asset prices and the relative exchange rate.

From the asset price, the process up to spending passes through the cost of borrowing and the total wealth which influence the final spending. So it's interesting to see more in detail the theoretical aspect of how a change in the asset price affects the nominal spending.

However, which channels are "touched" by the quantitative easing? There is a lot of disagreement around this topic. The academic literature keeps focus on two out of five of these channels; the portfolio balancing and the signalling channel. Those channels are considered by academics simultaneously but not for the characteristics (are very similar) but because they are complementary in a sort of way (they might work simultaneously).

It's normal to consider that all the channels mentioned until now support or affect each other. As we said before, there is a logical way which connects all those. Portfolio rebalancing and bank lending might affect the domestic demand, for example. Must be said, however, that's hard to have quantitative measures, for example the confidence channel is something that depends on other economic effects.

There are two main views on the channel relevance and on the effect of that, which causes a debate between economists as the topic of how (and if) a large scale asset purchase program is an answer for the interest rate at a zero lower bound.

Now it's important to describe the two views more in detail in order to understand as well the transmission mechanism.

1. Preferred Habitat Theory: the bases of this theory are, the assumption that various assets are imperfect substitutes, the credit constraint and imperfect markets which can modify the asset prices and their relative supplies. The Fed in its program starts to purchase the treasury bonds and MBS, with these actions the price of those assets goes up while their yield decreases; this encourages the investors to rebalance their portfolios for seeking more risky assets.

2. Irrelevance Proposition: in the other view (as in the New Keynesian model) the asset purchase by a central bank will change only the expectation of the agent regard the future policy rates. In this type of view the investor's behaviour, regard the asset purchase by the central bank, will not change; this because is taking in consideration the assumption that if you hold private or public asset it won't be different. In this view isn't considered the portfolio rebalancing effect.

1.4.1 Bond Yield

The core of QE is inside the bond market, where it's possible to see the real effect of the monetary policy. There is a strong correlation between the large scale asset purchase of long-term asset, made by Fed, and the federal funds rate cut (the classic tool used by Fed, in relation to the inflation). The main point is the similarity between the cutting of the federal fund rate which caused the decrease of Bond's yield and the purchase of assets (in this case bonds) which leads to an increase of their price and consequently the decrease of yield (even thought with a different mechanism).

1.4.2 The composition of Yield Curve

The yield is composed by the Risk Neutral Component, which is linked to the time value of money for which the investor must be compensated, and the Term Premium, which is linked to the compensation for the additional risk charged by the investors.

$$y_t^n = YRN_t^n + YTP_t^n$$

$$YRN_t^n = \textit{Risk Neutral Component}$$

$$YTP_t^n = \textit{Term Premium}$$

The monetary policy with the signalling channel has an effect on the risk neutral rate while the portfolio rebalancing channel has an effect on the term premium rate.

In the equation showed before the term premium, to be more detailed, can be decompose in a maturity term premium and as an instrument (specific) term premium.

$$YTP_t^n = YTP_{risk,t}^n + YTP_{instrument,t}^n$$

The change in the bond supply, after the large scale asset purchase program during the QE, affect the price of the instruments through the instrument term premium; but also change in the liquidity premiums are going to change this premium. This changes are going to measure not only the portfolio balancing channel effect but also the liquidity channel effect.

The large scale asset purchase program change (downward) the total amount of assets with a specific duration, this lead to a decrease of maturity term premium of the targeted assets but also of the non-targeted assets.

1.4.3 Portfolio Rebalancing Channel

In 2012 Ben Bernanke explains how the LSAP (large scale asset purchase) program could stimulate the real economy²⁵. One of the main points is the Portfolio Rebalancing Theory in which the large purchase of long term securities by Fed has effect on the investor's portfolio structure, by changing or mix them. The Fed uses the program under the assumption of imperfect substitutability of assets, this in relation to the specific needs and preferences of investors.

Compare to the assumption, many investors could look for finding similar investment with similar duration and yield. The Fed's hope is that the normal investor change or swift its portfolio from the agency-MBS securities (sold to Fed) to the long-date corporate bond, lowering the yield, to create better financial market conditions.

This kind of monetary policy (QE is an unconventional monetary policy) lead the Federal Reserve, under the assumption of imperfect substitution to purchase assets for a long-term interest rate effect and for a given short rate path.

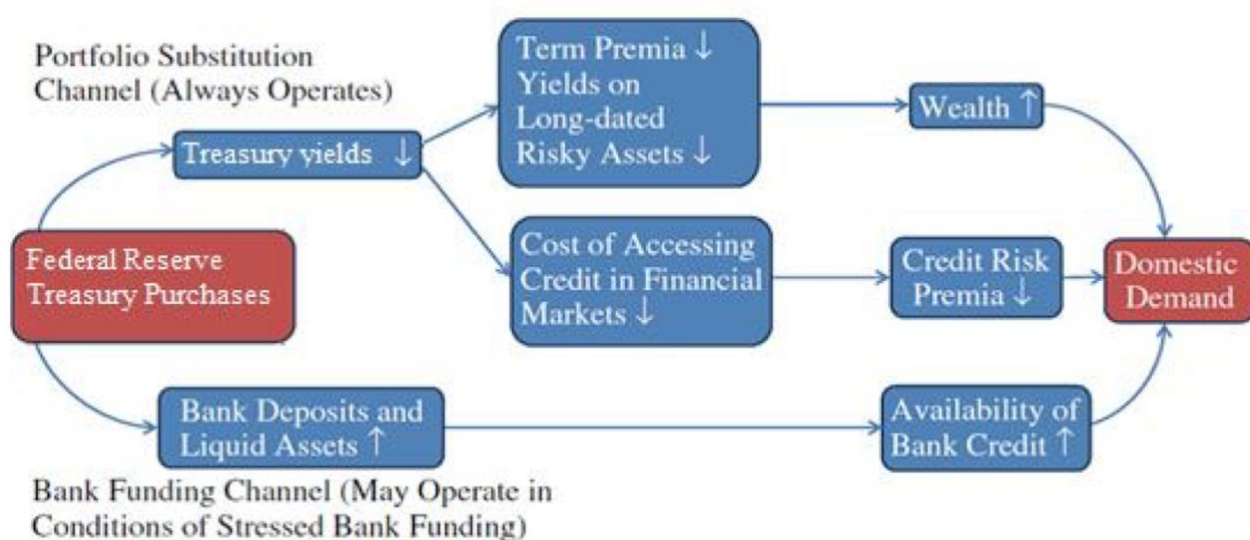
In 1969 Tobin explain that factors such as risk attitudes, risk estimates or expectation change the preferences of investors and so their portfolio; but it's not easy to quantify the impact of financial events, he also said how a monetary policy which stabilizes the price of physical assets is able to support the portfolio preferences compare to other sectors like bank or public ones.

In 1963 Friedman and Schwartz found that in case of open market operations there is an increase of financial asset's prices, the investors change their behaviour and shift their

²⁵ Monetary policy since the onset of the crisis, Bernanke, Federal Reserve Bank of Kansas City Economic Symposium (2012)

investments on non-financial assets (NFA)²⁶; this actions lead the investors to mix their portfolio with non-financial assets (which are relatively cheaper at the beginning) which become more expensive compare to new non-financial assets. If the demand of NFA goes up the prices as well go up with an increase of the wealth compared to the income; the wealth effect lead to a decrease of current services prices which cause the increase of the relative demand. This process explains how a monetary policy from the financial market is transferred to the consumer's market (services market).

Graph 3: Portfolio Rebalancing Channel, source Joyce (2012)



The portfolio rebalancing theory takes the assumption that bank deposit and bonds are not perfect substitutes and not a zero lower bound. Many investors shift from the long-term asset like treasuries (sold to Fed) to short term asset, bank deposits; however, this kind of investor, who don't believe to be a burden the portfolio's change, is a minorities. Other type of investors like pension funds or institutional investors or insurance firms prefer always long-dated assets and if they want rebalance the portfolio the shift will be in the same category of long-dated assets.

The large purchase of long-term assets causes a decrease of the term premium of those instruments, while there is a rise of long-terms corporate bonds and equities prices; this lead to a reduction of borrowing costs on financial markets.

²⁶ A monetary history of the United States, Friedman & Schwartz (1963)

Finally the demand or Gdp growth due to:

- the extra-investments of firms thanks to the funding on capital markets.
- the portion of gained wealth consumed by households, thanks to the capital gains of holding long-dated assets; this because the households think to be wealthier.

This mechanism is the result of the preferred habitat view and duration risk (or duration channel) theories.

1.4.4 Signalling Channel

When the investor's expectations change, regard the future monetary policy, the yield curve change at the same time; this happen when the FOMC (the Federal Open Market Committee) publish the statement in which there are the previsions of Fed regard the present and future economic conditions, and the latest previsions about the monetary policy's adjustment or its new objectives related to the target inflation.

As told before the signalling channel affects the risk neutral component of bond yield (already explained in the 1.4.1 and 1.4.2) through such statements which are going to alter the expectation on short-term rate and so on the long-term interest rate one; in the case of QE, it's going to lower the expectation on the long-term yield, as is already explained before related to the large scale asset purchase program made by Fed and all the consequences.

The signalling channel is not only used in unconventional monetary policy but in the conventional one too; the forward guidance and balance sheet policies, when there are zero lower bound, are the alternatives. Let's going to explain:

- Forward Guidance (FG): this are the statements reported by the institutions regard the future economic outlook and policy, and about the current policy adopted by the central bank with the specific target.

In the case of the last years, when there were zero lower bound, the only possible action for the central bank is to give information regard the future policy rate; this process is fundamental because the central bank, making its intention clear and with a strong guidance well-explained (specially during an unconventional period), wants to change the investor's expectations. In order to change them the central bank must clarify the difference between the new monetary policy (or the changes) and the old one, all of this for overshooting the future inflation target with the purpose of present inflation rate increase.

When the central bank makes a change in the monetary policy, with a new one or with a change in the old, it provides a forward guidance and undertakes itself under a promise of changing with a specific task; it cannot make a statement and implement the policy very later on, the central bank's "power" is the credibility, so it must consider the commitment for all the period mentioned in the forward guidance (and so the promise makes towards the investors).

The board members of Fed every four years report anonymous future expectations, those doesn't have much resonance or effect on markets and interest rate.

As said before the real power of FG is in the credibility of central bank and so in its ability to complete or try to get as close as possible to the commitment. If the central bank loses this power, it lost the ability the influence the investor's expectation regard the future! For example, in the Q1 (2009-2011) statement the Fed described the economic condition, the period is the one immediately after the crisis, and told explicitly and clearly the will of maintaining the Fed funds rate very low for a long period. The same intention of maintain such unconventional monetary policy could be found in the next guidance of 2013 related to the Q2.

This example explains well how important is to have a strong guidance with explicit intentions well cleared.

- Balance Sheet Policies: these are the change inside the central bank's balance sheet related to the size and the composition of the portfolio;

The purchasing of assets made by Fed with "new money" change the duration of portfolio, because the central bank sold short term asset and bought long term ones. The asset purchase, inside the signalling channel, is a useful instrument that support the forward guidance because it could help the market to understand better the intention of the Institution and the future interest rate policy.

Woodford in 2012²⁷ didn't agree about the possible replacement of forward guidance with balance sheet policies; for him this policy (if has any affect) must be a boosting to the central bank view on the economy and to the future monetary policy task. He didn't also agree regard the extension of asset purchase and the amount purchased; he said that not necessarily is better to buy more asset.

²⁷ Methods of policy accommodation at the interest-rate lower bound, Woodford, Columbia University (2012)

In 2010 Bernanke²⁸ also talked about the QE's cost in relation to the extra purchase which could reduce, in his opinion, the confidence of investors regard the ability for Fed to exit in time from the program. If this happened there would be a loss of confidence by the investors which lead to a financial and economic instability while the inflation expectation decreased.

1.4.5 Liquidity Channel

When the financial market is stressed a lot, the liquidity is considered as a secure asset; the investors demand liquidity premium in the case of non-liquid asset's purchase.

In the year of the crisis the market collapse so the investors wanted to be compensated with a higher liquidity premium on securities due to the higher risk taken. The QE increase the liquidity in the bond market and lead to lower liquidity premium on bond prices; but this policy increase the yield of liquid assets compare to non-liquid ones (must be said that this effect is present only during the acquisition period).

The bond market (or Treasury market) is already considered as a liquid market so the effect of QE on it is not so relevant. The liquidity channel inside the QE's view is not considered as a driving force of policy due to the liquidity of the government bond market and to the temporary characteristic; for those reasons the academic literature doesn't give a lot of attention to it. Moreover, there weren't spillover effect because the investors know that the Fed didn't affect, with its monetary policy, this market (the only case of spillover effect is in the case of portfolio rebalancing by investors, but it's very hard to quantify this effect).

The liquidity channel, in the case of private purchasing, tend to be more effective; but the Fed, unlike the Bank of England, cannot purchase private assets. In 2009 the BoE had the authorization to purchase 50 billions pounds of private assets/corporate bonds to increase liquidity in the ineffective credit market.

²⁸ What the Fed did and why: supporting the recovery and sustaining price stability, Bernanke, The Washington Post (2010, <http://washingtonpost.com/wp-dyn/content/article/2010/11/03/AR2010110307372.html>)

1.4.6 Confidence Channel

The confidence channel of quantitative easing can have effects on the inflation level and on the economic growth; this channel has a spillover effect on the other channels and so on the transmission mechanism of QE.

The role of this channel is to give confidence to investors and keep the inflation from falling more; confidence is crucial for the transmission monetary policy. This happens because the Fed, with its report and announcements, could change the agents' confidence if they believe in the central bank's operations. For example if the report gives improvements regard the economic outlook it will change the confidence of every agent present in the market (firms, consumers etc.), who is going to spend and invest more than before due to the positive news reported. Finally, must be said that this channel can reduce the asset prices due to the confidence which lead to a decrease of risk premium on those securities (Hausken, Ncube 2013)²⁹.

1.4.6.1 The correlation between Market and Confidence

Some studies confirmed the strong correlation between agent's confidence and the domestic demand; moreover, the macroeconomic cycles and the confidence channel are strong correlated (Fei 2011)³⁰.

From what is said before, it almost seems that the signalling channel and the confidence one are very similar. In 2013 Fratzscher, Lo Duca & Straub³¹ in their work said that the first channel (the signalling one) is linked to the interest rate path, decided by Fed, while the second one (the confidence channel) is referred to the condition of the economy market; in fact the last one, with changing the investor's perception of the risk, lead to a portfolio rebalancing and a decrease in the asset prices. At the end, it's possible to say that the information from confidence are distinct from the signalling ones.

²⁹ Quantitative Easing and its impact in the US, Japan, the UK and Europe, Hausken & Ncube, Springer (2013)

³⁰ The confidence channel for the transmission of shocks, Fei, ENSAE Paristech in France and Humboldt Universitat zu Berlin (2011)

³¹ On the international spillovers of US Quantitative Easing, Fratzscher, Lo Duca & Straub (2013)

In the case of Quantitative Easing the large scale asset purchase made could have two interpretations for the investors:

- The first one lead the investor to believe that the economic condition are worse compared to what expected before. This result causes a decrease in all assets prices and makes agents prey for a safe haven³².
- The secondo one lead the investors to think that the increase of economic outlook prevision by the central bank lead this one to keep or to increase the large scale asset purchase program.

This view are opposite and this can explain well how important is the confidence channel for the transmission monetary policy and for the portfolio decision and the asset prices.

The confidence could exist only if the central bank and the agents talks to each other in an clearly way for both. A central bank is credible only if people believe it will do what is says³³, this is a key point for the monetary policy transmission system.

This confidence and credibility rely in the central bank's ability to pursue the goals prefixed and achieve them, among the people³⁴. If those (credibility and reputation) are present it will lead to an increase of the investor's confidence regard the economic market.

The confidence strategy is related to the connection between the Federal Reserve and the market confidence, this is well explained by the chain CCC in a new Keynesian view.

The CCC is composed by three characteristics:

1. Communication
2. Common Understanding
3. Confidence

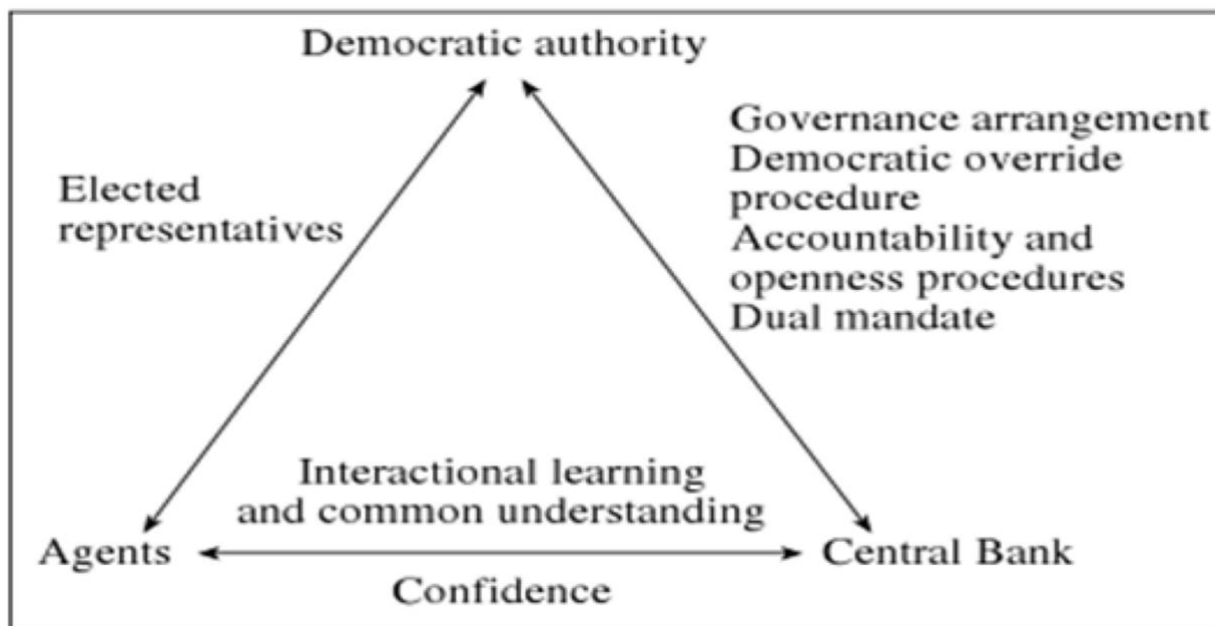
This kind of framework is correlated not only with the "economic actors" as the central banks or the agents but also with the democratic authority or government.

³² Unconventional monetary policy had large international effects, Neely, Journal of Banking & Finance (2015)

³³ Central Bank Credibility: why do we care? How do we built it? Blinder (1999)

³⁴ Reputation, credibility and monetary policy effectiveness, Montes, Estudos Economicos Sao Paulo (2009)

Graph 4: The CCC chain, confidence strategy (Source: Wray and Forstater 2006)



This graph represents the confidence strategy and the CCC chain with all its factors and challenges, which must be considered in the confidence channel.

The most important graph's part, if related to the economic view and for this paper, is the interactional learning and common understanding between the agents and the central bank.

In a world "so social" the people's thoughts must be considered because they are shared by all the others; this could lead to an increase or a decrease of confidence levels. There was a lot of scepticism and indecision at the beginning of Quantitative Easing; the topic was new, this create communication's barriers due to the complexity, the not well-known assumptions and even languages barriers. Many experts agree on the central bank's transparency and "opening" as fundamental for the monetary policy.

The Fed in the last years demonstrates a high "opening"; in fact Bernanke in 2004 said the word "Fedspeak"³⁵ for referring to the communication's way of Federal Reserve. It is characterized by a clear and exhaustive language, with the purpose of the mutual comprehension between agents and central bank.

³⁵ Fedspeak. Remarks at the meetings of the American Economic Association, Bernanke, San Diego California (2004)

Some economist³⁶ discovered the existence of a confidence channel, in the case of monetary shock, inside the transmission of a monetary policy. For example if there is a monetary stretch, the household's confidence decrease a lot, triggered by the change in the Fed funds rate.

In 2008 Portier and other economists³⁷ (on the assumption that also the direction decided by Fed for the monetary policy has a significant effect on the people's confidence) used a value at risk model to demonstrate that if there are positive news regard the USA economic outlook, like the increase of productivity, this will affect the nearby countries as Canada (Spillover effect).

In 2014 another study conducted by Janssen, Potjagailo and Wolters³⁸, demonstrated how important is the confidence channel among the transmission system, analysing two cases:

1. A non-crisis scenario: in which the people's confidence has a normal response to an expansionary policy compare to the second scenario.
2. A crisis scenario: in which the people's confidence has a higher response to monetary shock, while there is a crisis especially during its period of recession stage, and to an expansionary policy (even if higher compare to the non-crisis scenario).

1.4.7 Bank Lending Channel

In the case of crisis, as the last one of 2008, the bank channel is not so effective due to the problem of bank's refinancing themselves; they are no able, due to the recapitalization problem, to grant loans as before. However, the banks are fundamental actors inside the transmission system of central bank, because they grant the efficiency of the lending market. The banks, as the other financial intermediaries, are essential for the monetary policy transmission and for granting the necessary liquidity³⁹.

³⁶ Confidence and the transmission of monetary policy shocks. Debes, Gareis, Mayer & Ruth (2014) University of Wuerzburg, Department of Economics, Sanderring, Wuerzburg Germany

³⁷ The International propagation of news shocks. Beaudry, Dupaigne & Portier, Center for economic policy and research discussion papers (2008)

³⁸ Monetary policy during financial crises: Is the transmission mechanism impaired? Janssen, Potjagailo & Wolters, University of Kiel and Kiel Institute for the World Economy (2014)

³⁹ Financial intermediaries, financial stability, and monetary policy. Adrian & Shin, FRB of New York Staff Report (2008)

The bank lending channel works through the bank's balance sheet⁴⁰, so there will be a change in the balance sheet liabilities and assets; as said before, in case of crisis or of contractionary monetary policy the banks' reserves decrease and this lead to a needed recapitalization. If there is this kind of situation (the bank normally has low reservable deposits) the banks replace, with non reservable liabilities or with a reduction of assets, the reservable liabilities lost. For example they will use loans and securities to maintain asset and liabilities at the same level, despite the reduction of those latter.

In 1998 there were some studies on bank lending channel, for explaining how the bank deposits react to a monetary policy and its transmission channels; because this type of channel is fundamental for the academic research regard banks⁴¹. When there is the word deposit, it refers to the bank's total amount to be loanable to the market.

A contractionary monetary policy provokes a reduction of those deposits and so of the bank's capability to give loan; the bank lending power decreases for instance. Some economists demonstrate this kind of reaction, when there is a policy contraction, in their paper⁴².

However, in 2010 Disyatat⁴³, demonstrate that this kind of lending channel regard the banks is not so correct; in his paper he said the process is the opposite, compare what said before, this means the loans as the driver of the deposit levels. Another theory is based on the assumption that the monetary shock is affected or caused by the quality of assets, the bank's leverage (this is the most important, but must be taken in consideration all the leverage of financial intermediaries) and the risk's perception; so the level of deposits are a consequence of the financial intermediaries themselves.

In 1995 Peek and Rosengren⁴⁴ focus their study on the importance of capital constraints for the banks.

They said that these constraints influence the behaviour of banks, in the case of a monetary policy change, regard the deposits with the increase of those ones. In the case of a slacken monetary policy, if the bank has not constraints his total deposits allow to rise; while in the case of the capital constraints' presence the bank cannot increase its balance sheet under the constraint of leverage ratio.

⁴⁰ The Oxford handbook of banking. Berger, Molyneux & Wilson, Oxford University Press (2015)

⁴¹ Credit, Money, and Aggregate Demand. Bernanke & Blinder, The American Economic review papers and proceedings (1988)

⁴² The impact of monetary policy on bank balance sheets. Kashyap & Stein, Carnegie-Rochester conference series on public policy (1995)

⁴³ The bank lending channel revisited. Disyatat, Journal of Money, Credit and Banking (2011)

⁴⁴ Bank lending and the transmission of monetary policy. Peek & Rosengren, Conference Series-Federal Reserve Bank of Boston (1995)

Regarding the first case, the increase of deposits leads to an increase in the loan supply market. In the case of an unconventional policy (like quantitative easing), the central banks are able to obtain funding in an easier way compared to private banks; this could lead to a decrease of credit's cost and tend to maintain the aggregate demand at the same level (preventing a decrease). All of this can be related to the central assets purchase's discussion; for some economists, the balance sheet constraints of banks or financial intermediaries are seen as the justification for quantitative easing (or for an unconventional monetary policy in general); because these kinds of purchases are more similar to a financial intermediation of central banks, done to create a better financial condition and to guarantee the access of the private sector to credit.

An effective bank lending channel (if we consider as assets bank loans, state bonds and money) to be effective must have three requirements:

1. First Requirement: if there is a change in the money supply, the prices mustn't change immediately. In simple words, money, in the short run, has to be neutral if there is any change of monetary policy.
2. Second Requirement: if there is a large scale assets purchase program, so open market operations, there must be a change in the bank loan's supply.
3. Third Requirement: as already discussed in 1.4.3 regarding the portfolio rebalancing channel, the money and the government bonds mustn't be perfect substitutes for agents.

In the neo-classical channel the bank lending channel, as the credit channel, is strongly connected; the assumption of the imperfections' presence in the market is the basis of those kinds of channels.

The imperfections are the inefficiency of the credit market and the asymmetric information, which lead to the behaviour's change of banks regarding their liabilities.

A bank which is big, with a good level of transparency and healthy, could raise external and uninsured funds in a simple way; it does that for covering its liabilities (while there is a little reduction of its assets). This process of non-reserve liabilities' raising differs from bank to bank. The importance of those non-reserve liabilities is related to their usage as a source of funding in case of monetary policy tightening.

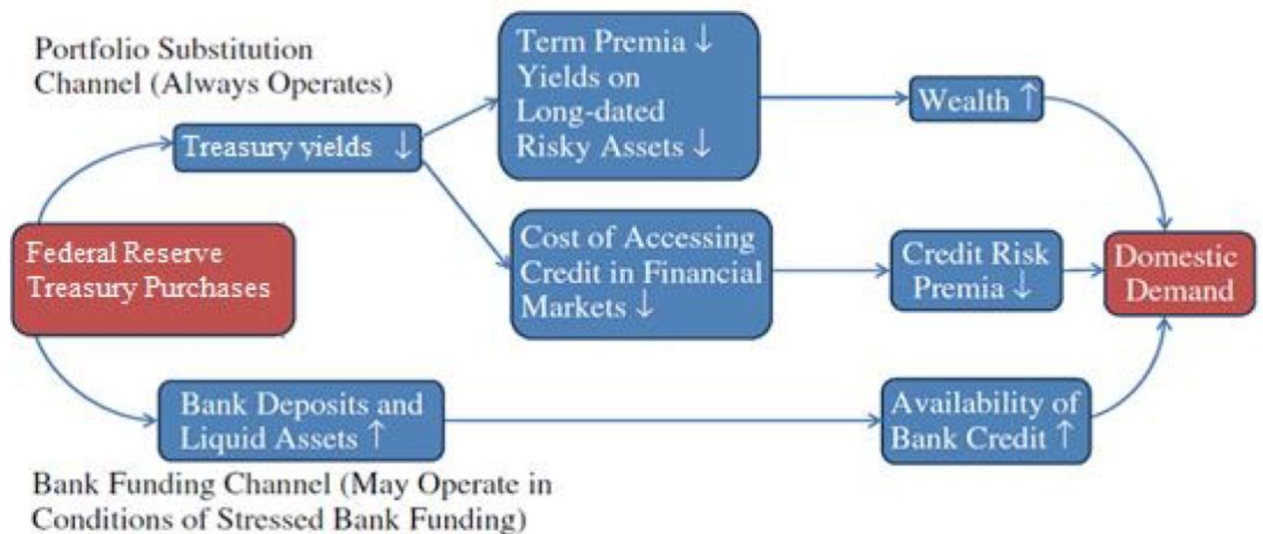
This topic is supported by the research of Holod and Peek⁴⁵, which make a distinction between publicly traded banks and non-publicly portfolio loans, to analyse the external raising's capability of publicly banks and not.

The results show that, in the case of a monetary policy tightens, the loan portfolio of publicly banks decrease less compare to the non-publicly ones.

If there are imperfections in the market and there is a contraction in the monetary policy, the agents (borrowers) tend to shift from the non-bank loans to bank loan ones; this happens because the market imperfection change the perception of firms regard the bonds and non-bank loans, which now are considered as perfect substitutes. Finally can be said that, as a result, this reduction in bank credit has no effect on the aggregate demand.

1.4.7.1 QE and Bank Lending Channel

Graph 5: Portfolio Rebalancing Channel, source Joyce (2012), repeated.



In the graph, already used in the portfolio rebalancing channel (p. 32), is possible to see the connection between the bank lending channel and the portfolio rebalancing one, and how they interact.

⁴⁵ Asymmetric information and liquidity constraints: a new test. Holod & Peek, Journal of Banking & Finance (2007)

As it's possible to see the large scale asset (treasuries) purchase lead to an increase in the bank deposits and liquid assets, this increase the bank's capability to grant credit.

The bank lending channel is more effective under two events:

1. When there is a crisis, the banks doesn't have liquidity and the financial market doesn't perform well.
2. When the bank, due to the large scale asset purchase program and the extension of debt's maturity term, is financed by long-term debts rather than short term ones; this provoke a liquidity's retention by the bank, which give less loans compare to before⁴⁶.

As Joyce⁴⁷ already said, the bank lending channel (with the spillover effect of credit channel) could give more credit to the market; but as it's said before in the second event this is unlikely to happen, due to the bank's preclusion to grant loans despite the liquidity.

In such case there are two possibilities:

- If the central bank (with asset purchase) gives long-term fund to the bank, it could increase or avoid the contraction of lending market.
- If the central bank gives short-term deposit to the bank, the channel will have a weak effect. This happens because the banks increase their reserve to insure against the risk of withdrawn in the short term.

In many research⁴⁸ a fundamental assumption is that the deposits are more desirable compared to the external funding source, this because the first one are cheaper compared to the costs of the second one.

When the Quantitative Easing was done, a lot of people think that this means a huge injection of capital into banks' reserves; this way of thinking was demolish by the publication of 2015 by Butt, Churm and McMahon⁴⁹. They explain how the process of large scale assets purchase affected the bank lending channel.

⁴⁶ Central bank asset purchase I: the theory. Konig, Bernoth & Raab (2015)

http://www.diw.de/de/diw_01.c.500157.de/presse/diw_roundup/central_bank_asset_purchase_i_the_theory.html

⁴⁷ Quantitative Easing and Unconventional monetary policy? Joyce, Miles, Scott & Vayanos, The Economic Journal (2012)

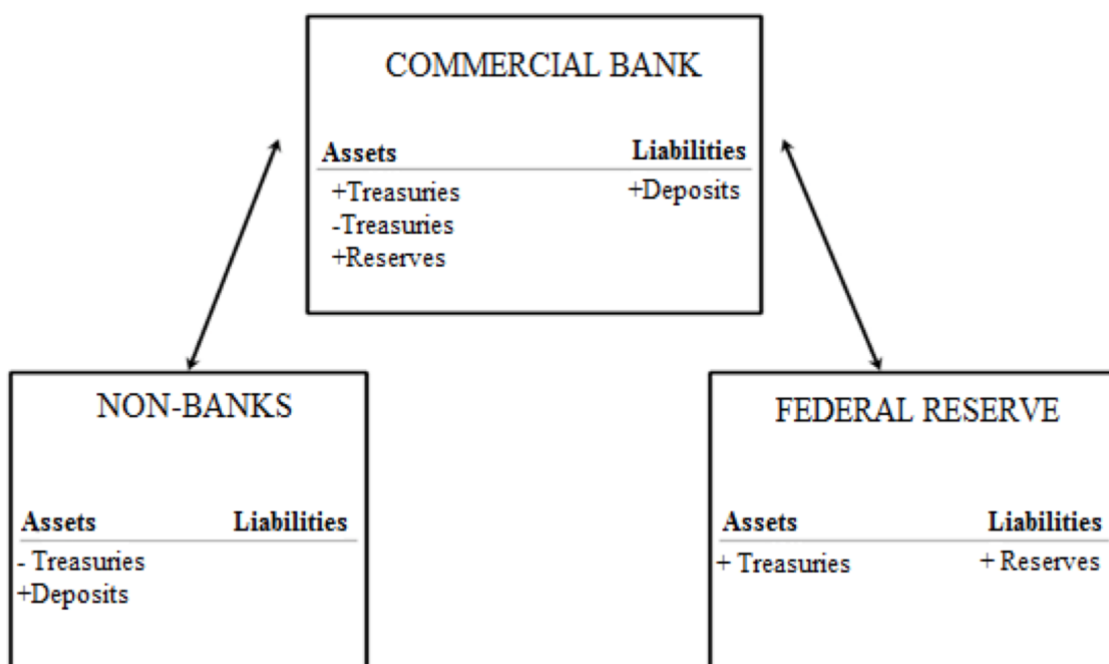
⁴⁸ The impact of monetary policy on bank balance sheets. Kashyap & Stein, Carnegie-Rochester conference series on public policy (1995)

⁴⁹ Did Quantitative Easing boost bank lending? Butt, Churm & McMahon,

<http://bankunderground.co.uk/2015/07/17/did-quantitative-easing-boost-bank-lending/> (2015)

In the real world the central bank bought assets not from the banks but from the financial intermediaries (non-banks) to make the channel effective among all the transmission system. To do that the Fed bought medium, long-term assets from the non-banks; this kind of financial intermediaries, also named as Other Financial Corporations, are the pension funds and the insurance (there are many more, those two are the, most important). However the bank has a critical role in this process because it was elected by Fed to operate as intermediary in the transaction service regard the Quantitative Easing Program.

Graph 6: The actors' process (source: Butt, Churm and McMahon, 2015)



The graph 6 shows the balance sheet of the actors involved inside the process:

- The Federal Reserve, as the buyer of assets.
- The commercial bank, as the intermediary of transactions.
- The non-bank, as the seller of assets.

The process is the following one; the other financial corporation sell its assets (like bond or other securities), this lead to an increase of non-bank's deposits, while the Fed's treasuries go up (the commercial is an intermediary so it will have a plus and minus of treasuries). On the side of liabilities, the Fed creates reserves to buy bonds and other treasuries from the

commercial bank (this lead to note the plus item reserves on the assets side of commercial bank) and the deposits of commercial bank are the result of the treasuries' acquisition from the non-bank (remember the commercial bank has only a transition role inside this process; reserves on the asset side and deposit on the liability side, as a result of the transaction process).

1.5 Nominal Spending From The Change In Asset Prices

The large scale asset purchase program had: an effect of many interest as a result passed through the various transmission channels, and an effect on the asset prices (which could be lowered compare to before). If the monetary policy had an effect at the end of the chain, it means in the "private market", there would been a change of private borrowing rates⁵⁰. The final objective of the Lsap program is the economic growth, a decrease in the rate of unemployment and achieve the inflation target wanted. This is possible due to the generation of wealth effects and the decrease of borrowing's cost by the Lsap program.

1.5.1 Cost of Borrowing

If the transmission channel had any effects on the asset prices, this means that it had an effect on interest rates too⁵¹. The cost of borrowing and the interest rates are the same thing. If the borrowing's cost goes down the people are more likely to borrow and so to spend and the firms to invest in the same way, this because have savings it's not convenience as before the Lsap (the return's rate of savings decreases compared to the willingness of spending). For example in the case of QE the Fed was interested in buying MBS, with the effect of influence the demand and the supply of those assets. If there is the purchase by central bank, the price of MBS goes up and the availability for the public of decreases, which cause a further price's drop while the yield drops too. This cause the drop of mortgage rates and of corporate bond yield; the purchases of MBS lead the investors to change their investment and so to rebalance their portfolio on the new assumption made on the Fed's announcements. In this way the unconventional monetary policy has pushed down various borrowing rates⁵².

⁵⁰ The signalling channel for Federal Reserve bond purchases. Bauer & Rudebusch, International journal of central banking (2014)

⁵¹ Conducting monetary policy at very low short term interest rates. Bernanke & Reinhart, Presented at the meetings of the American Association (2004)

⁵² The federal reserve's unconventional policies. Williams, FRBSF Economic letter (2012)

If it happens (the decrease of borrowing's cost), the big firms are pleased of the better financing condition on the capital market, this because there is a reduction of the corporate bond rates.

Who is not affected is the small business firm and the households, they cannot have a rebalancing portfolio effect and cannot enter in the capital markets.

The world globalization of today creates connection between the big firms and small ones, this lead to the supply chain effect. The small company will benefit from the decrease of borrowing costs or the increase of the demand, which affect the big supplier of the small one.

The government also benefit from what said before, because it must financing itself as the big firms on the capital markets (if there are lower borrowing's cost the result is obvious).

While the small firms or the households think inside a short-term period, the government takes a long-term view on the period considered regard the financing and investing decisions. However the interest rates' cyclical change should be useless regard spending decisions⁵³.

1.5.2 Wealth Effects

In the case of QE as already mentioned before, due to the asset purchase the private sector or agent holdings swift from bonds to bank deposits or reserves. This swap doesn't create value for both parties so there is no add to the total wealth; in fact when someone changes the bonds for bank deposit, this mean not that he is "richer or wealthier" but only that he has more liquidity for investments or spending.

The Lsap made by Fed reduce the specific bond's supply on the market, while there is a reduction of interest rates due to the demand's increase for the bonds not acquire by the program.

The wealth effect occurs when there is an upward shift of asset prices; the assets' holders now are wealthier, this should lead to an increase of spending and of nominal demand.

However the increase of prices doesn't mean the same for the fundamentals⁵⁴. For example if a firm buy its own stocks, the prices of them increase instantly but the firm after all it's still the same! The amount available of stock decreases but it doesn't mean higher future stock price!

⁵³ Unconventional monetary policy: the assessment. Bowdler & Radia, Oxford Review of Economic Policy (2012)

⁵⁴ Understanding Quantitative Easing. Roche, Ovidius University Annals, Series economic sciences (2014)

In this case there isn't a wealth effect because there isn't a creation of it but only an increase of prices due to the unconventional monetary policy. In fact the wealth effect is a result of other confirming effects which must be in place for increasing the prices; this means that this effect relies on more than the only asset's supply.

This unconventional monetary policy of Quantitative Easing has the same involvements for spenders and savers; it's possible to say that the Lsap program, due to the unconventional nature of the policy, creates differences in the wealth distribution.

1.6 Corporate Bond

The studies regarding Quantitative Easing find that the Treasury Yield decreases more compared to the corporate bonds⁵⁵. This was possible due to the analysis of treasuries and corporate bond yields during Q1 and the other phases of the program.

1.6.1 Comparative studies on corporate bond's yield, during QE

In a decade, the BB bonds decrease of 43 basis points, the BBB bonds of 80 basis points while the AA bonds of 89 basis points. The Quantitative Easing affects all the bonds maturities (from CCC to AAA); the decrease of yield was higher on the long maturity bonds compared to the short maturity bonds. The credit spread's increase, due to the bad news regarding the economy's outlook, and it reduces the effect of yield's decrease. If the credit spread goes up, it will have a powerful effect on the BBB, BB (and lower quality) and short term maturities bonds.

For example, during the Q1 and the initial part of Q2, the corporate bond's yield decreases of 12,5 basis points due to the monetary policy shock; this decrease disappears in the following months, however the effect and its strength to support the economy were limited and not eliminated⁵⁶.

During the QE the BAA bonds yield decrease a lot, in a range between 67-74 basis points, it depends on the date considered; while from the start of Q1 until the end the BAA yield there was a decrease of 482 basis points (Gagnon, 2011).

⁵⁵ The signalling channel for Federal Reserve bond purchases. Bauer & Rudebusch, International journal of central banking (2014)

⁵⁶ What does monetary policy do at the zero lower bound. Wright, NBER working paper (2011)

Also the AAA and BAA bonds decrease in Q1, respectively of 77 basis points the first type and 81 the other one⁵⁷; while in the Q2 decrease of 23 and 18 basis points the same ones. Moreover another economist found that the BAA bonds yield decrease of 35 basis points at Q1 time (Neely 2010).

1.6.2 The effect of QE on corporate bond's yield

Now it's important to analyse the effect of QE on the corporate bond's yield in the Moody's Seasoned, the analysis will focus on AAA and BAA bonds; the first ones are considered as a risk free investment due to the high investment grade, while the second ones are considered a safe investments even if they have a lower investment grade.

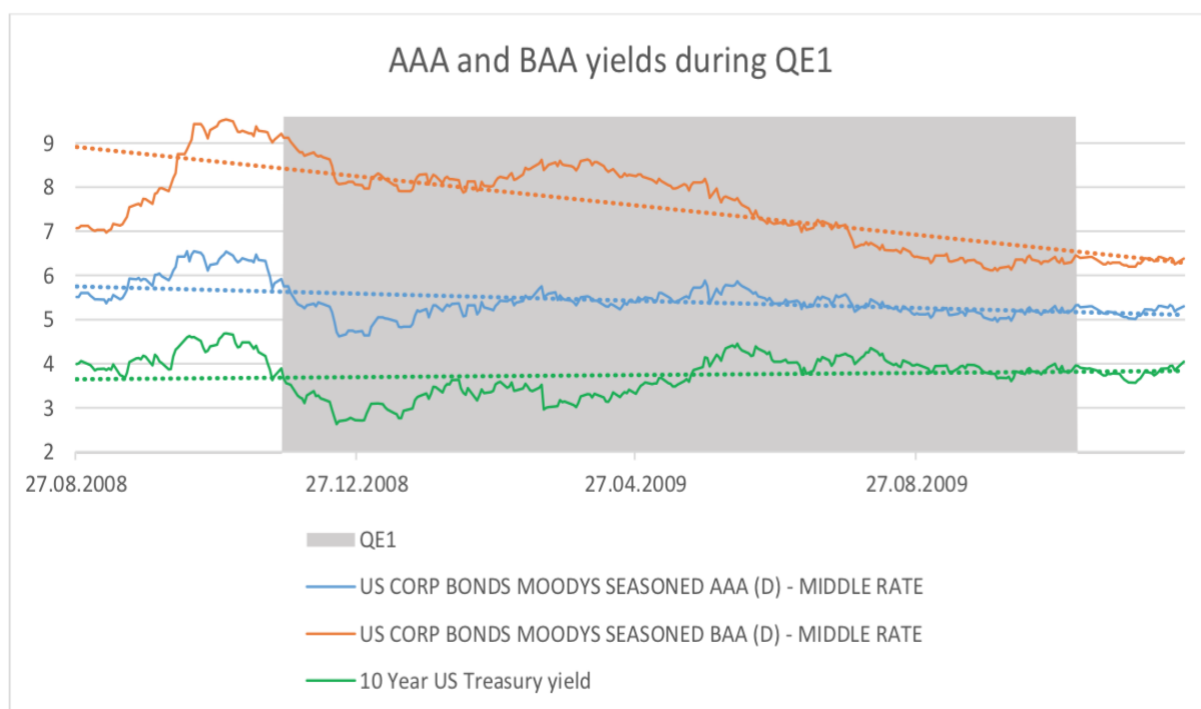
Table 2: The change of yields correlated to any important QE's event (Source, Datastream)

US CORP BONDS MOODYS SEASONED BAA (D) - MIDDLE RATE			US CORP BONDS MOODYS SEASONED AAA (D) - MIDDLE RATE		
QE1		One day change Yield Change			One day change Yield Change
25.11.08	FOMC Statement	-9,000	25.11.08	FOMC Statement	-17,000
01.12.08	Bernanke Speech	-19,000	01.12.08	Bernanke Speech	-25,000
16.12.08	FOMC Statement	-15,000	16.12.08	FOMC Statement	-13,000
28.01.09	FOMC Statement	14,000	28.01.09	FOMC Statement	15,000
18.03.09	FOMC Statement	-23,000	18.03.09	FOMC Statement	-24,000
12.08.09	FOMC Statement	10,000	12.08.09	FOMC Statement	9,000
23.09.09	FOMC Statement	-2,000	23.09.09	FOMC Statement	-1,000
04.11.09	FOMC Statement	9,000	04.11.09	FOMC Statement	8,000
Total		-35	Total		-48
QE2 and OT		Yield Change			Yield Change
27.08.10	Bernanke Speech	17	27.08.10	Bernanke Speech	17
21.09.10	FOMC Statement	-8	21.09.10	FOMC Statement	-2
12.10.10	FOMC Min Released	4	12.10.10	FOMC Min Released	5
15.10.10	Bernanke Speech	10	15.10.10	Bernanke Speech	9
03.11.10	FOMC Statement	12	03.11.10	FOMC Statement	12
22.06.11	FOMC Statement	1	22.06.11	FOMC Statement	0
21.09.11	FOMC Statement	-16	21.09.11	FOMC Statement	-1
20.06.12	FOMC Statement	-2	20.06.12	FOMC Statement	-3
Total		18	Total		37
QE3		Yield Change			Yield Change
22.08.12	FOMC Min Released	-10	22.08.12	FOMC Min Released	-10
13.09.12	FOMC Statement	1	13.09.12	FOMC Statement	3
12.12.12	FOMC Statement	5	12.12.12	FOMC Statement	6
18.09.13	FOMC Statement	-9	18.09.13	FOMC Statement	-8
Total		-13	Total		-9
TAPERING		Yield Change			Yield Change
22.05.13	Bernanke Q&A	6	22.05.13	Bernanke Q&A	6
19.06.13	FOMC Statement	8	19.06.13	FOMC Statement	7
18.12.13	FOMC Statement	4	18.12.13	FOMC Statement	0
Total		18	Total		13

⁵⁷ The ins and outs of LSAP's. Krishnamurthy & Vissing-Jorgensen Federal Reserve Bank, 2011

The table 2 shows the yield's change related to the event dates and also the cumulative change ones.

Graph 7: QE1, corporate bond's yields and treasury rates (Source, Datastream)



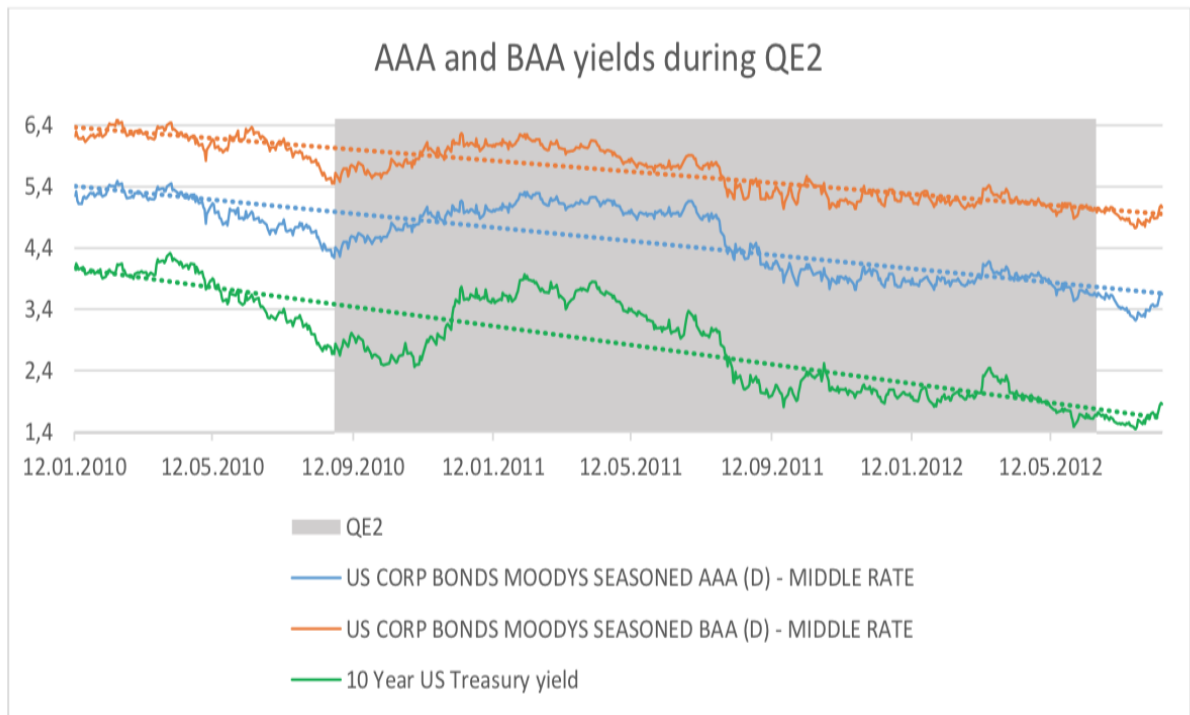
Related to the Q1 period, the AAA and BAA middle-rate decrease of 48 basis points the first one, while the second of 35 basis points. From those reductions it's simple to see the effect of QE not only on the yield of purchased treasuries but also to the other ones.

In the graph 7 it's possible to see the yields of AAA and BAA bonds compared to the 10 years Us Treasury yield. During the Q1 the yield of AAA bonds and of the Us 10 years treasuries has the same path, while the BAA bonds has fallen compare to the last ones.

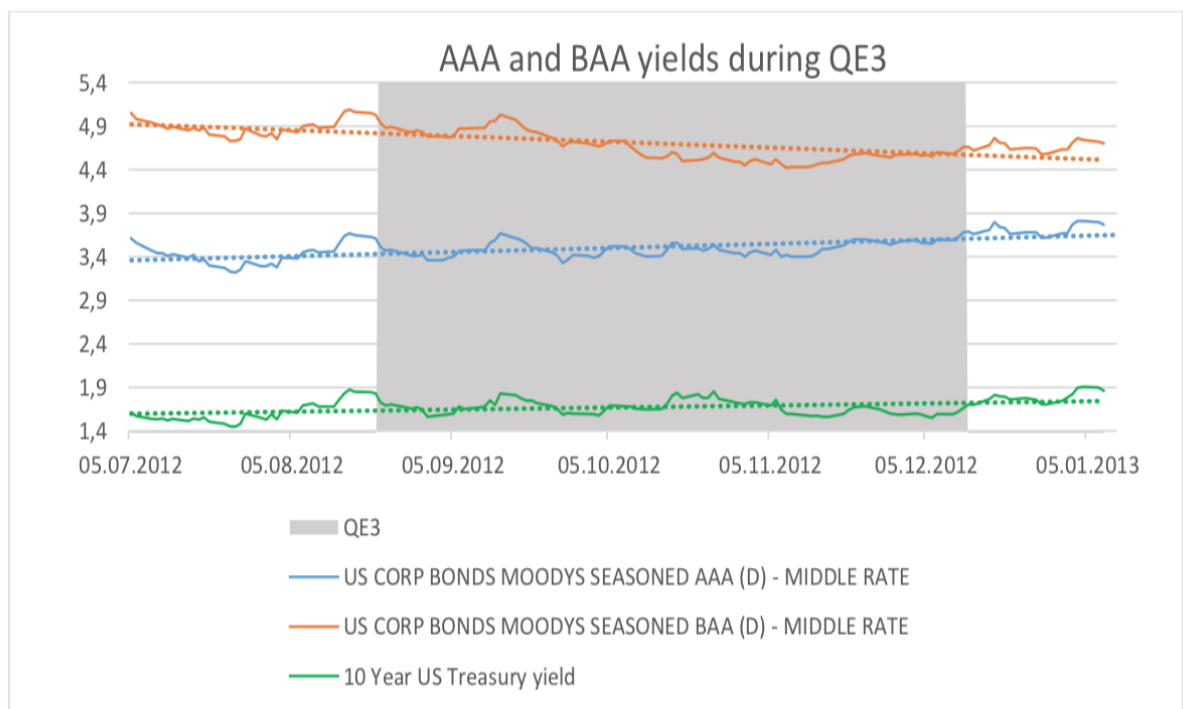
In the beginning of Q2 the AAA and BAA bond yields increases as the 10 year Us treasury rates; the first one gains 37 basis points, the second one gains 18 basis points (the path of treasury rates is very similar to the AAA bonds). This growth was caused by the market, which already known the future change of the policy from Q1 to Q2, and so adjust the yield on the news already reported but still not realized.

In the middle of Q2 (July, 2011) all the bonds and treasuries started a downward period with an important decrease in the rates. Dissimilar from Q1, in the Q2 the path of AAA and BAA, during the downward period, is more or less the same; while the treasury rate had a worst drop compared to the others. The graph 8 evidence all what it's said before.

Graph 8: QE2, corporate bond's yields and treasury rates (Source, Datastream)



Graph 9: QE3, corporate bond's yields and treasury rates (Source, Datastream)

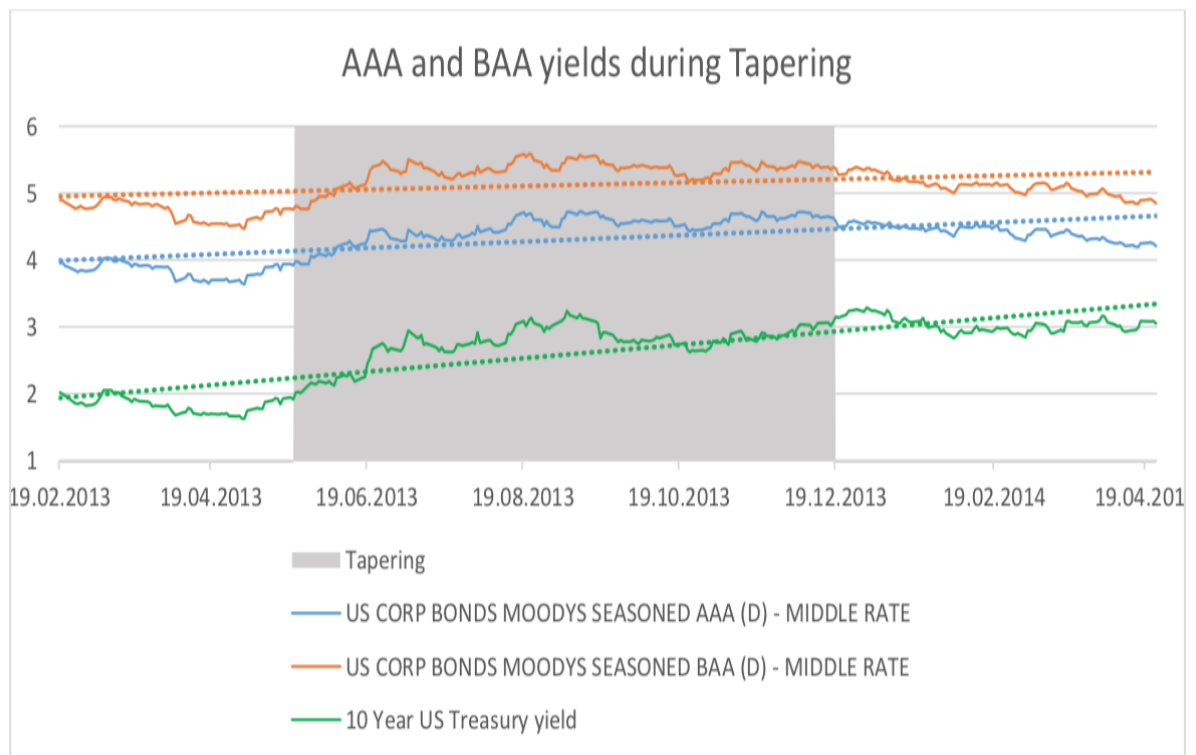


In the Q3 there was a small reduction in the AAA and BAA bond yields respectively, of 9 basis points the first one and of 13 basis points the second one; for all the period the two bonds keep a low yield, also because there were few alterations.

As in the Q1 the paths of AAA yield and the one of Us Treasury were the same path compared to the BAA one; which not only followed a different way, but also ended the Q3 at a lower level compared to the starting one (the AAA and Us Treasury bonds ended the Q3 in positive compare to the beginning). It's easy to see the analogy between the Q1 and Q3, and the results of the latter were as expected.

The graph 9 is the representation of what said until now.

Graph 10: Tapering, corporate bond's yields and treasury rates (Source, Datastream)



In the tapering period the AAA and BAA had the same trend; with an increase of 13 basis points for the first one and of 18 basis points for the second one. During this period were not change in the expectations, so there is normal trend without shaking.

As is possible to see in the graph 10, the Us Treasury yield path were more aggressive compared to the two already described.

From what has been seen before, there is a correlation between the large scale asset purchase program made by Fed and the corporate bond yields; as is possible to see the strong correlation between the assets purchase program and the Us treasury.

If there is a change in the treasury yield path, a change in the bonds path will be certain; this lead the bond yields to followed the Us Treasury ones. This assertion steady the portfolio balance effect already explained before.

1.7 Connection between stock market and investor's confidence

Some theories and empirical works evidence how a change in the monetary policy will lead to a change in the stock prices and so finally to a change in the private portfolio value (this is the wealth effect). This mechanism is going to change also the cost of capital as well⁵⁸.

Bernanke in 2010 said, in an interview for the Washington Post⁵⁹, that if there is an increase in the stock prices this will make the consumer wealthier than before, which cause the increase of confidence and at least of spending. This happens because the yields on long-term treasuries go down and so the equity prices go up.

This is a result of three components⁶⁰:

1. First: if the discount rate goes down, the investors can use it to obtain an higher valuation related to the future cash flow and an higher valuation of the stock market.
2. Second: because there is the portfolio balance effect, which lead the investors to shift their investments from the long-term assets to more risky assets, as equities.
3. Third: if the cost of capital (or borrowing costs) goes down and there is a strong economy recovery, the firm will have higher profit which will affect in a positive way the prices.

⁵⁸ What explains the stock market's reaction to federal reserve policy? Bernanke & Kuttner, *The journal of finance* (2005)

⁵⁹ What the Fed did and why: supporting the recovery and sustaining price stability, Bernanke, *The Washington Post* (2010, <http://washingtonpost.com/wp-dyn/content/article/2010/11/03/AR2010110307372.html>)

⁶⁰ QE and ultra-low interest rates: distributional effect and risk. Dobbs, Lund, Koller & Shwayder, *McKinsey* (2013)

If there is a conventional monetary policy some studies (done to analyse the impact of monetary policy on equity prices) demonstrate how a cut in the Fed's fund rates of 25 basis points can be translated into an increase of 1% of the excess stock prices.

1.7.1 Investors and Consumers Confidence

The efficiency of confidence channel is strongly connected with investors and consumers confidence index. This kind of instrument is not well developed yet and so it's not able to notice the stock market performance. However it's important to remind the arguable connection between business cycle or change in business and the confidence of the consumer⁶¹.

The monetary policy is not the only tool for the government to improve the market conditions; also the fiscal policy has a strong impact on the confidence and on the economic recovery⁶².

From the monetary policy considering the confidence effects, the Fed, established unemployment or inflation target through use of fund rate and its transmission mechanism, trying to achieve the selected targets. In the case of the last crisis, the Fed used an unconventional monetary policy, the Quantitative Easing, for helping the market by changing the interbank market conditions.

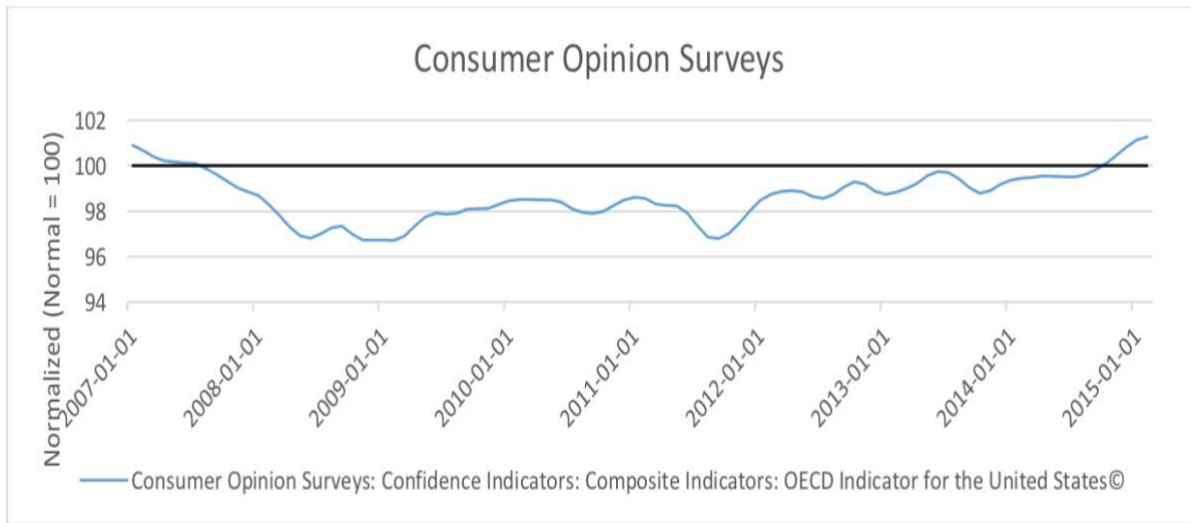
This paper doesn't speak about those factors, but in the economy's effects they might be very important.

During the Quantitative Easing program, there was a growth of consumer and investors (or business) confidence; it was negative, at the beginning of the crisis in 2008, but thanks to the QE it becomes positive after the program.

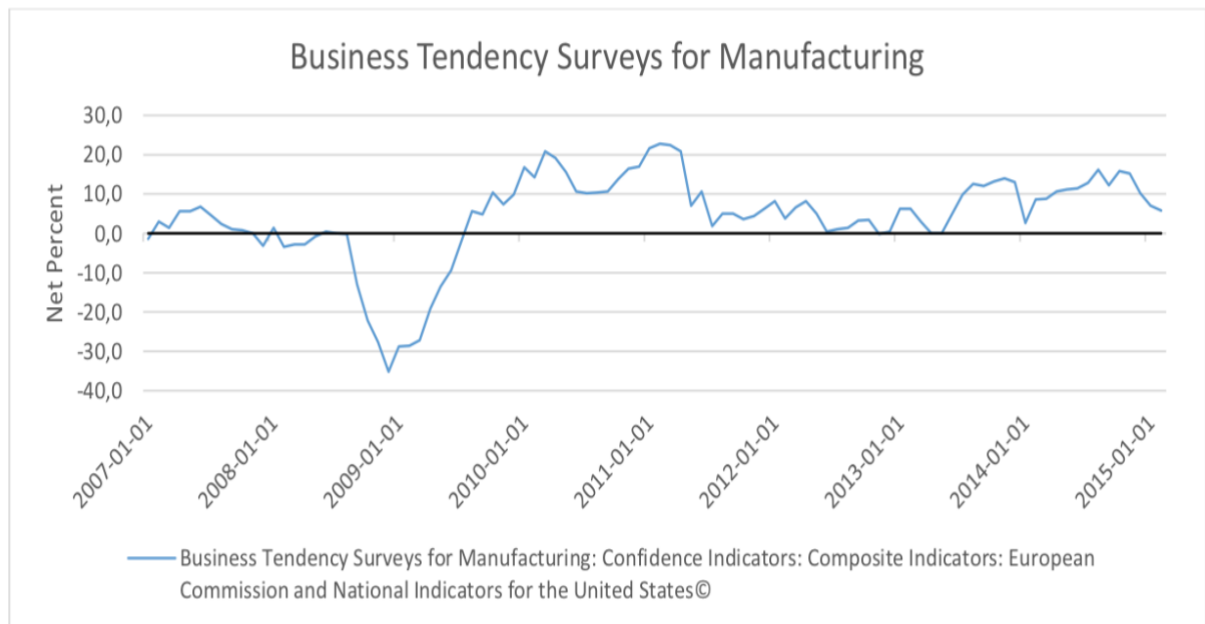
⁶¹ Confidence and the Business Cycle. Leduc, FRBSF economic letter (2010)

⁶² Fiscal policy and economic recovery. Romer, Business Economics (2009)

Graph 11: Consumer Confidence Survey (Source, Organization for Economic Co-Operation and Development)



Graph 12: Agents Confidence (Source, Organization for Economic Co-Operation and Development)



As it's possible to see from the graphs there is a quickly growth at the same of QE's starting; the crucial aspect is that the monetary policy isn't able to work without the consumer's and business's confidence, which are fundamental for the economic growth.

If the confidence levels decrease, critics will consider the QE as ineffective; other critics may could say that the confidence is not the only factor to be taken into consideration.

Other critics have an opposite view; they said that the confidence, if there is an increase, will be a factor of upsides with the QE and not into.

There isn't a correct and wrong theory; it's possible to measure the up or down of consumer's confidence at a specific date, but it might be impossible to measure the change (due to the change in confidence) in macroeconomic policy.

1.7.2 QE effect on stock market, comparative studies

If the FOMC makes a policy announcement, for example a new expansionary monetary policy, this will lead to an increase of equity prices for the S&P 500 index.

As already said before; the large scale asset purchase program and its portfolio balance effect, lead the investors to shift their investments from long-term bonds to more risky assets⁶³. It's important to remember that the program made by Fed had the task to support the stock market⁶⁴.

If it's made a simulation; the S&P 500 index without the Fed's QE, from the start of the crisis until the end, should have started a negative trend. Instead with the Q1's start the index rise up by 5,25%⁶⁵. The news also have a strong impact on the stock prices.

Some studies⁶⁶ have demonstrate the impact of an unconventional monetary policy on the index and so on the stock prices; using a time series regression, a decrease of 25 basis points in the 10 years Us Treasury rates, found that an increase of 11,2% of the S&P 500 index and to an increase of 12,7% of the Dow Jones Industrial Average index.

Another paper demonstrates two reaction⁶⁷:

- If there aren't zero lower bound, a decrease of 100 point basis in Government Treasury Rate is translated into an increase of 6-9% of equity prices.

⁶³ Tail-risk perceptions around unconventional monetary policy announcements. Hattori, BIS quarterly review (2014)

⁶⁴ Quantitative Easing and its impact in the US, Japan, the UK and Europe, Hausken & Ncube, Springer (2013)

⁶⁵ Unconventional monetary policy had large international effects, Neely, Journal of Banking & Finance (2010)

⁶⁶ The impact of unconventional monetary policy on real estate markets. Gabriel & Lutz, SSRN 2493873 (2014)

⁶⁷ The response of equity prices to movements in Long-Term interest rates associated with monetary policy statements: before and after the zero lower bound. Kiley, Journal of money credit & banking (2014)

- If there are zero lower bound, the effect described before is more weak, and the reaction to QE news is equal to an increase of 1,5-3% of the equity prices.

In the second case the effect is weak, not for the correlation between Treasury rates and equity prices, but for the effect of the monetary policy on the short-term and long-term interest rates which have effects on equity prices, and of course for the mandatory zero lower bound.

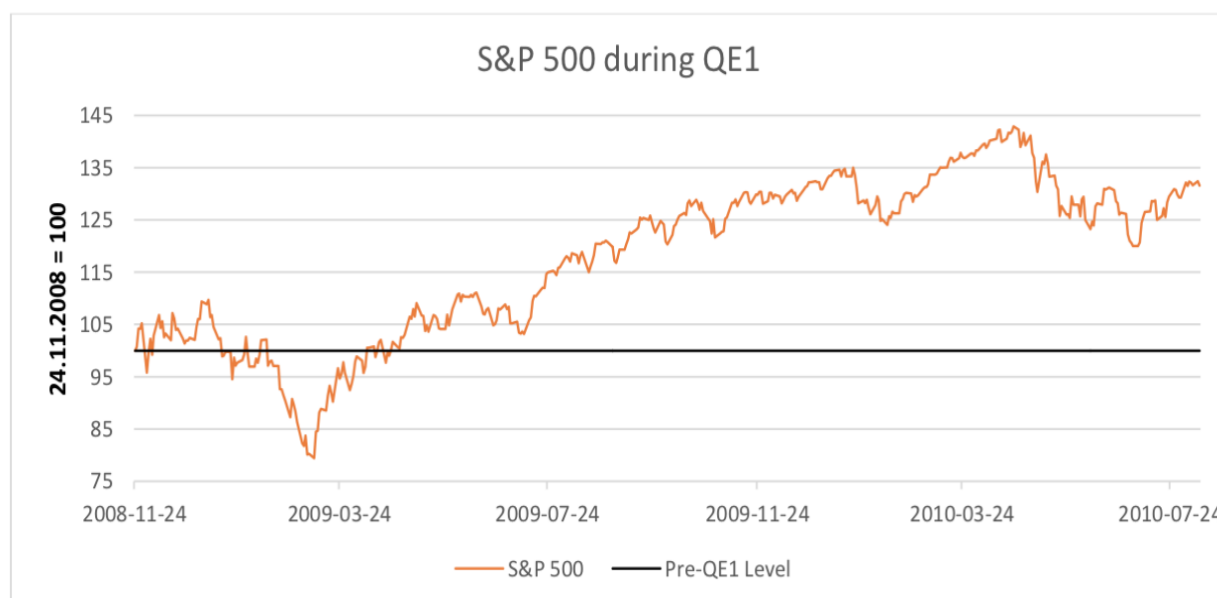
1.7.3 Stock market, QE's effects

In this part there will be the analysis of QE's impact on stock market, more in specific the impact on the S&P 500 index.

At the beginning of Q1 the S&P 500 index rise up of 11,48%; however in the 01.12.2008 the index lost the 5% due to bad news (the release of US construction spending and the ISM index) and not for the Bernanke's speech, in addition in the same day the NBER declared the state of recession for the US economy⁶⁸.

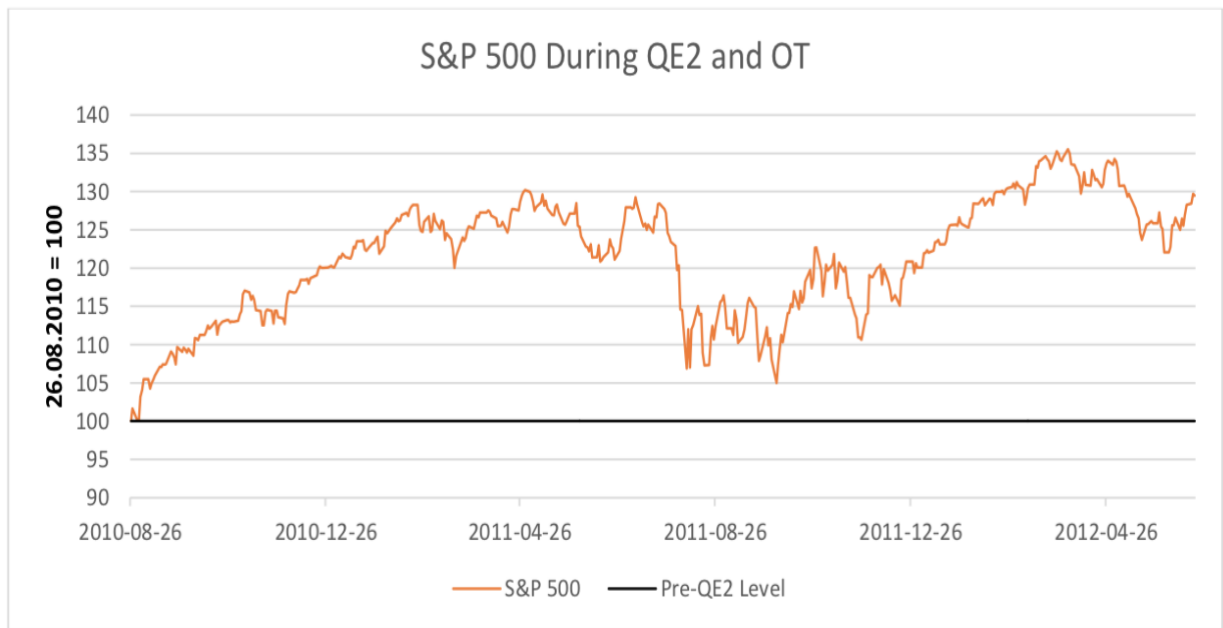
In the graph below it's possible to see the fall in the spring of 2009 of stock prices.

Graph 13: Q1 and S&P 500 index (Source, S&P Dow Jones Indices LLC)



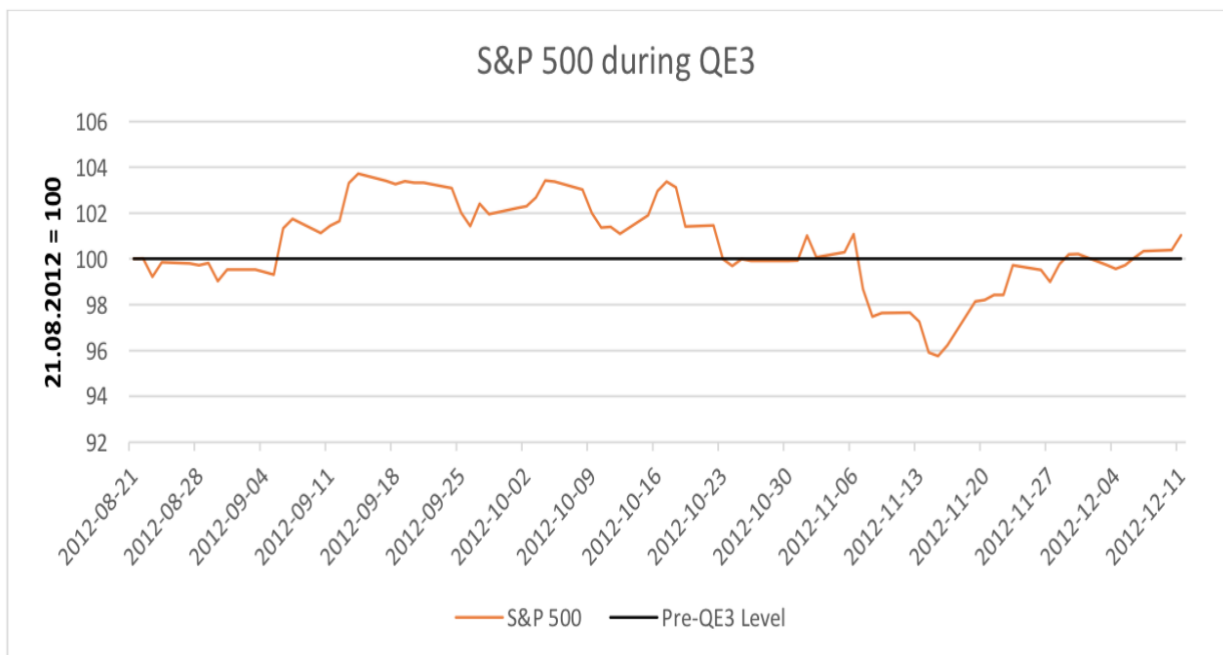
⁶⁸ Unconventional monetary policy had large international effects, Neely, Journal of Banking & Finance (2010)

Graph 14: Q2 and S&P 500 index (Source, S&P Dow Jones Indices LLC)



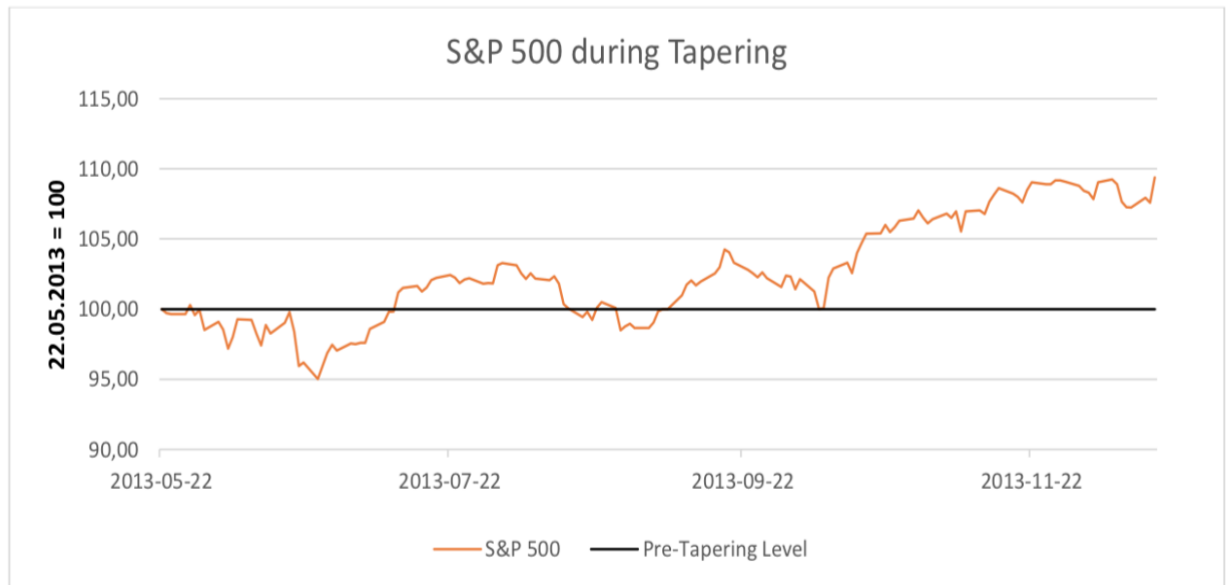
In the Q2 the index fell by 1,4%, but there isn't any particular shock, the market reacts as expected; the index was anyway over the pre Q2 level.

Graph 15: Q3 and S&P 500 index (Source, S&P Dow Jones Indices LLC)



In the Q3 the index rise up by 3%; however the index was under the pre Q3 level. This means the absence of any shock during that period.

Graph 16: Tapering and S&P 500 index (Source, S&P Dow Jones Indices LLC)



In the Tapering period there isn't such a great movement, with a little increase of 0,67%; the index was near the pre tapering level for all the period, until the mid-October where there is relevant rise up.

During the 2007 and 2008, following the crisis, the S&P 500 index started a downward trend, while with QE's starting there is a growth for all the period of Quantitative Easing program. It's possible to see it in the graph 16.

Graph 17: S&P 500 index from 2005 to 2015

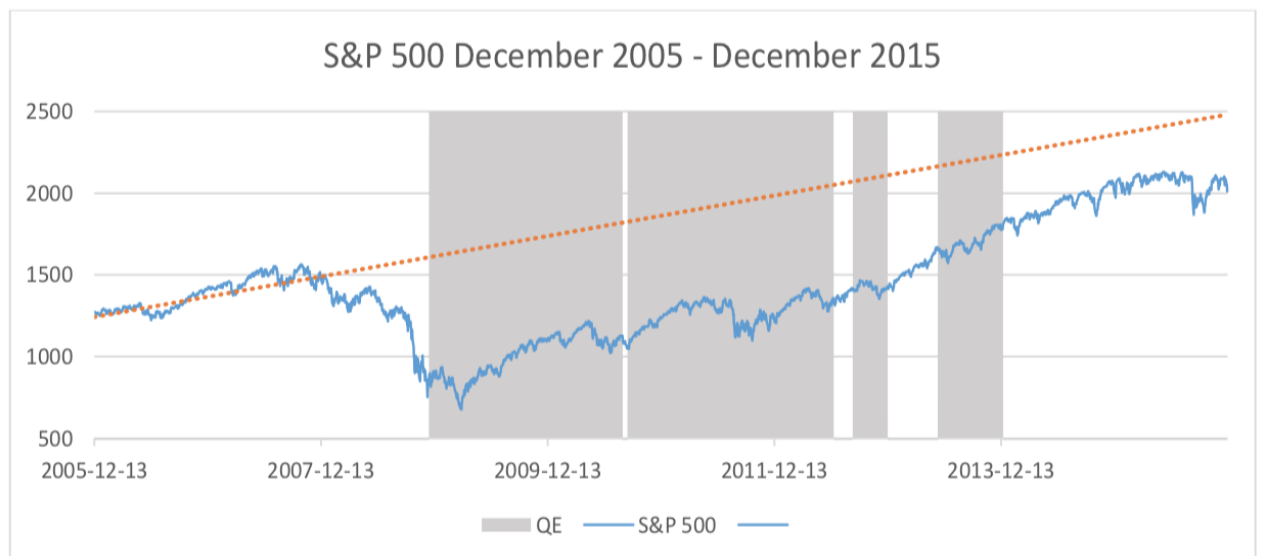


Table 3: S&P 500 index data from the Q1 to Tapering

QE1		S&P 500
25.11.08	FOMC Statement	0,655 %
01.12.08	Bernanke Speech	Data missing
16.12.08	FOMC Statement	5,136 %
28.01.09	FOMC Statement	3,356 %
18.03.09	FOMC Statement	2,086 %
12.08.09	FOMC Statement	1,153 %
23.09.09	FOMC Statement	-1,007 %
04.11.09	FOMC Statement	0,104 %
Total		11,483 %
QE2 and OT		
27.08.10	Bernanke Speech	1,659 %
21.09.10	FOMC Statement	-0,256 %
12.10.10	FOMC Min Released	0,382 %
15.10.10	Bernanke Speech	0,203 %
03.11.10	FOMC Statement	0,368 %
22.06.11	FOMC Statement	-0,647 %
21.09.11	FOMC Statement	-2,939 %
20.06.12	FOMC Statement	-0,169 %
Total		-1,400 %
QE3		
22.08.12	FOMC Min Released	0,023 %
13.09.12	FOMC Statement	1,631 %
12.12.12	FOMC Statement	0,045 %
18.09.13	FOMC Statement	1,218 %
Total		2,916 %
TAPERING		
22.05.13	FOMC Statement	-0,827 %
19.06.13	FOMC Min Released	-1,385 %
18.09.13	FOMC Statement	1,218 %
18.12.13	FOMC Statement	1,665 %
Total		0,670 %

1.8 QE impact on Firm Financing

In this part there will be the empirical studies on the real effects of an unconventional monetary policy (the Quantitative Easing) on the firms.

The Federal Reserve with the Large Scale Asset Purchase program wanted the yield curve to be flatten, this due to the selling of 400 billions short term securities and buying the same amount of long term securities. By reducing the long-term treasuries securities supply, the maturity extension program (MEP) was aimed to lower the interest rates on long-term assets and indirectly lower the cost of credit for households and firms (especially firms which rely on long-term debt)⁶⁹. It's already explained before how the monetary policy, the QE, affected the bond yield and finally the cost of debt for firms, householders and final consumers; so now let's going to look to the data for the empirical analysis.

1.8.1 Data related to the Long-Term Debt and MEP

MEP had an impact on asset prices and firm's behaviour, thanks to the analysis of Foley-Fisher, Ramcharan and Yu on Compustat and CRSP.

Thanks to Compustat they have computed, with annual frequency, the firm's long term debt dependence ratio and other firm's characteristics (financial firms are excluded), this thanks computing the share of long-term debt on the total balance sheet debt of a firm.

To limit the potential biased estimated they took in consideration a large number of firm's level controls, this because there are too many industries with different purposes and so nature of assets. Those controls include: market capitalization, total assets and two others. They include also: two measures of profitability (net income growth and ROA), two measures to control's firm investment opportunity (average Q and firm's CapEx on net sales) and a measure of short term financing (the difference between receivables and payables). Than a measure of capital intensity and final they include the four variable Kaplan-Zingales (1997) for long term debt dependence could also rely on the firm's dependence on external finance⁷⁰. The graph X1 shows numbers of how the long-term debt dependence is correlated with other firm's balance sheet characteristics.

⁶⁹ The impact of Unconventional Monetary Policy on Firm Financing Constraints: Evidence from the Maturity Extension Program, Foley-Fisher, Ramcharan and Yu; December 2014 Federal Reserve Board Philadelphia.

⁷⁰ Ibidem

Table 4: Summary Statistics before 2007 (Source Foley-Fisher, Ramcharan and Yu, December 2014)

Variable	Description	No. Obs.	MEAN	SD	5%	25%	50%	75%	95%	Corr. with 'ls'
ls	Long-term Debt Share	3304	0.82	0.25	0.23	0.74	0.92	1.00	1.00	N.A.
mktcap	Market Capitalization (billions)	2570	1.58	4.24	0.02	0.11	0.35	1.08	6.49	0.01
b2m	Book to Market Ratio	2569	0.56	0.39	0.11	0.29	0.49	0.75	1.24	-0.02
td	Total Debts (normalized by total assets)	2719	0.36	0.96	0.000	0.003	0.03	0.22	2.00	0.09
ldebt	Long-term Debts (normalized by total assets)	2637	0.27	0.28	0.00	0.07	0.20	0.37	0.80	0.25
at	Total Assets	2723	1.16	2.85	0.01	0.05	0.22	0.80	5.72	0.06
nig	Net Income Growth	2607	0.19	0.35	-0.32	0.06	0.14	0.30	0.81	0.01
roa	Return on Assets	2453	0.00	0.09	-0.18	-0.018	0.03	0.05	0.07	0.04
ni2a	Income over assets	2640	-0.03	0.80	-0.85	0.06	0.15	0.21	0.37	0.09
Q	Average Q	2548	6.35	16.08	1.18	1.58	2.44	4.83	18.08	-0.09
i2s	Investment Opportunity	2679	0.40	1.59	0.01	0.03	0.06	0.15	1.19	0.01
kz4	Kaplan-Zingales Score	2634	-0.05	4.64	-3.98	0.01	0.82	1.47	2.45	0.05
rp2s	Short-term Financial Constraint	2674	-0.13	1.18	-0.44	0.00	0.07	0.13	0.24	0.02
d2a	Capital Intensity	2640	0.06	0.05	0.02	0.03	0.05	0.07	0.14	0.04

This table reports the number of observation, mean, standard deviation, and, various percentiles of all the independent variables in the event study regressions. All variables are averages of firm level characteristics over time before 2007. Variables are winsorized at the 1% level to reduce the effects of outliers. The last column of the table reports the correlation coefficient between the Long-term debt dependent ratio and all other control variables.

1.8.2 Regression Results

Now let's going to see if there is an impact by the MEP announcement and the forward guidance on firm profitability; in the column 1 of the graph X2 there are the results of a simple ordinary least squares regression of abnormal returns (obtained by using a standard one factor model) of firms at the end of 2011 on firm's long term dependences (the research doesn't include 2007 for the financial crisis)⁷¹. The coefficient calculated is positive and very important statistically significant; in this case the abnormal return rises up by 0.21 percentage if there is a one standard deviation increase in the long term debt ratio (50% in annualized term), some sectors are affected more than others of course, the column 2 reports the fixed effects of sector in the regression and the result is very significantly.

The change in term spread influence the stock price, this variation depends on the size of the firm or on its potential growth. In column 3 there is the computation of historical average of market cap and book to market ratio of firms; the results mean how the impact of long-term debt is more relevant compare to the size or potential growth of the firm⁷².

In column 4 there are the controls for firm leverage, the impact of this latter is positive on the abnormal returns, even if the coefficient on long-term debt remains more significant⁷³.

In column 5 there are some measures of profitability which depend on short term and external financing and on capital intensity; the coefficient on long term debt dependence is unchanged⁷⁴.

In column 6 some other control variables considerations; in column 7 are computed the historical averages for all variables before the MEP announcement. The impact of long term debt dependence on abnormal returns after all those variables is still positive and significant⁷⁵.

In the last column 8 there is the coefficient for the long term debt dependence, which is still positive and significant, as a result of the regression with the new extra control related to the sensitivity of the stock price to an unexpected monetary shock; correlated to the short term interest rates influence on firm value in this regression model (already explained by Kuttner in 2001 and Bernanke in 2005)⁷⁶.

⁷¹ The impact of Unconventional Monetary Policy on Firm Financing Constraints: Evidence from the Maturity Extension Program, Foley-Fisher, Ramcharan and Yu; December 2014 Federal Reserve Board Philadelphia.

⁷² Ibidem

⁷³ Ibidem

⁷⁴ Ibidem

⁷⁵ Ibidem

⁷⁶ Ibidem

Table 5: Long-term debt and abnormal returns, regression analysis (Source Foley-Fisher, Ramcharan and Yu, December 2014)

	Abnormal Returns on Sep 22, 2011							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Avg Long-Term Debt	0.85**	0.91**	0.90**	1.03***	1.22***	0.97**	1.79***	1.31***
Share	(2.14)	(2.11)	(2.54)	(2.83)	(3.14)	(2.54)	(5.70)	(3.42)
mkcap			-0.0095	0.000073	0.0020	0.0052	-0.020	0.0051
			(-0.62)	(0.00)	(0.10)	(0.67)	(-0.87)	(0.25)
b2m			-0.62***	-0.68***	-0.59***	-0.37	-0.75***	-0.49**
			(-3.22)	(-3.54)	(-2.92)	(-1.06)	(-4.37)	(-2.11)
td				-0.099	-0.043	-0.026	-0.015	-0.058
				(-1.16)	(-0.38)	(-0.49)	(-0.14)	(-0.50)
ldebt				-0.70**	-0.91***	0.052	-0.70*	-0.98***
				(-2.52)	(-2.74)	(0.12)	(-1.94)	(-2.84)
at					-0.016	-0.0085	-0.0035	-0.018
					(-0.28)	(-0.44)	(-0.07)	(-0.30)
rig					-0.31	-0.0057	0.075	-0.31
					(-1.18)	(-0.05)	(0.20)	(-1.19)
roa					1.85	3.34	0.086	1.58
					(1.14)	(1.63)	(0.08)	(0.98)
ni2a					-0.16	-0.57	0.099	-0.11
					(-1.25)	(-1.04)	(0.48)	(-0.84)
Q					0.020***	-0.0051	0.020*	0.020***
					(2.77)	(-0.10)	(1.91)	(2.64)
i2s					-0.0080	-0.27**	-0.083	-0.0060
					(-0.09)	(-2.13)	(-1.46)	(-0.06)
kz4					0.015	0.0018	0.0061	0.0082
					(0.72)	(0.02)	(0.22)	(0.43)
rj2s					0.086	-0.52***	-0.023	0.049
					(0.54)	(-3.18)	(-0.19)	(0.33)
d2a					-1.35	-2.84	-2.30	-0.93
					(-0.60)	(-0.73)	(-0.87)	(-0.40)
Sensitivity to Monetary Shocks								40.7
								(0.63)
Fixed Effects		SIC 3	SIC 3	SIC 3	SIC 3	SIC 3	SIC 3	SIC 3
Long-term Debt Average	pre-2007 average	pre-2007 average	pre-2007 average	pre-2007 average	pre-2007 average	pre-2007 average	before Sep 21, 2011 last	pre-2007 average
Control Variable Average	pre-2007 average	pre-2007 average	pre-2007 average	pre-2007 average	pre-2007 average	available pre-2007	before Sep 21, 2011	pre-2007 average
Observations	2618	2618	2492	2478	2369	2369	2759	2341
R-squared	0.003	0.145	0.150	0.147	0.156	0.152	0.157	0.151

The dependent variable is the abnormal stock returns on September 22, 2011, after controlling for market returns. Standard errors in parentheses are clustered at the SIC 3 industry level. *** p<0.01, ** p<0.05, * p<0.1. Periods of control variables that are used for average are given in the table.

1.8.3 External Financing

From the last part of the paper it's possible to see, how if a firm depends more on long term debt its value increase disproportionately compared to a firm with less long-term debt.

The data analysed in this part rely on the assumption that MEP affected the cost of longer term external finance, this lead the firm (which use long term debt as financing source) to take more debt during the MEP period⁷⁷. The Fed's quantitative easing with the purchasing of long-term treasuries on the market reduce the supply of those latter, this lead the investors to shift towards more risky assets as the corporate bonds; the firms were likely to issue corporate during MEP period, due to the low cost of debt and the availability of investors to invest on them. The test made by Foley-Fisher, Ramcharan and Yu (December 2014), used a difference in difference estimation strategy to examine whether the stock of longer duration debt rose faster during the MEP's implementation at firms with a preference for this kind of debt⁷⁸ (they focus their studies on the extensive margin, and investigate on MEP potential impact on the cost and availability of external finance).

Let's going to analyse the graph X3 more in detail:

- Column 1: dependent variable related to the growth in the stock of long term debt; the coefficient would be positive if the firms, more reliant on long term debt, increase their credit usage during MEP. There are important evidence with the preferred habitat hypothesis, the results in column 1 suggest that a one standard deviation higher long term debt ratio lead to a rise up by 7% of growth in the stock long term debt⁷⁹. The firms with more financial flexibility could, during MEP's period, "adjust" their debt to take advantage from the low cost of borrowing (Greenwood, Hanson and Stein, 2010).
- Column 2: the coefficient related to the short term growth is not relevant as the one related to the short term debt, this means how the MEP affects the long term cost of borrowing rather than the short one.
- Column 3: reports the results related to the firms in the bottom quartile of the index.
- Column 4: reports the result related to the firms above the 25th percentile. There is a huge difference between those one and the latter (column 3). A one standard deviation increase in long term debt dependence is associated with a 4% percentage points

⁷⁷ The impact of Unconventional Monetary Policy on Firm Financing Constraints: Evidence from the Maturity Extension Program, Foley-Fisher, Ramcharan and Yu; December 2014 Federal Reserve Board Philadelphia.

⁷⁸ Ibidem

⁷⁹ Ibidem

increase in the long term debt growth rate⁸⁰; while in the top quartile of flexibility there is a 13% rise up in the long term debt growth rate during MEP⁸¹.

Table 6: Change in firm's long term debt during MEP (Source Foley-Fisher, Ramcharan and Yu, December 2014).

	(1)	(2)	(3)	(4)
VARIABLES	long term debt	short term debt	Kaplan-Zingales Index<25th percentile	Kaplan-Zingales Index>=25th percentile
long term debt dependence*MEP	0.29**	0.42	0.53**	0.18
	(2.33)	(1.56)	(2.23)	(1.17)
Observations	15,919	5,823	3,931	11,988
R-squared	0.303	0.285	0.321	0.303

The dependent variable in columns 1, 3-4 is the growth in long term debt outstanding. In column 2, the dependent variable is the growth in short term debt. Numbers in parentheses are t-statistics. Standard errors are clustered by firms and years. *** p<0.01, ** p<0.05, * p<0.1. The MEP indicator variable equals 1 if the year is 2012 and 0 otherwise. The sample period is 2007-2013, and all specifications include firm fixed effects, and all the time invariant firm observables in column 8 of Table 3 interacted with the MEP indicator variable. All time invariant variables are observed pre-2007. These variables also enter linearly as time varying controls. The Kaplan-Zingales (1997) index is a measure of financial flexibility: higher values suggest less financial flexibility. Variables are winsorized at the 1% level.

1.8.4 Conclusion

In this part there is the evidence of how the firm's abnormal returns, which rely more on long term debt (preferred habitat theory and limitation arbitrage on bond market, with those assumptions), change in positive during MEP's period; and how the MEP affect in positive the growth of firm's long term debt (the firms which rely more on that) and their investments (if there is the issue of debt by the firms, this will be used for investments of course!)⁸².

The MEP affects also the demand of corporate bonds (already explained, related to the portfolio rebalancing channel) by investors (which have to find more risky assets due to the decrease of treasuries yield after the QE). The conclusion is that the LSAP program might have helped to relax firms financing constraints at firms and so stimulating the economic recovery⁸³.

⁸⁰ The impact of Unconventional Monetary Policy on Firm Financing Constraints: Evidence from the Maturity Extension Program, Foley-Fisher, Ramcharan and Yu; December 2014 Federal Reserve Board Philadelphia.

⁸¹ Ibidem

⁸² Ibidem

⁸³ Ibidem

Chapter 2: M&A, Cap. Expenditures, Buybacks

In this chapter there will be the analysis of the firm's component, which make possible the analysis of that paper; in order the Merger & Acquisition analysis, the Capital Expenditures analysis and the Buybacks analysis.

In the first part of the chapter, thanks to many reports made by the big advisory firms (as Kpmg, Deloitte or Bureau Van Dijk), there will be the explanation of what they are, why they are made and the possible fails of those. Then let's going to analyse the trend of M&A market; from 2003-2006 (the pre-crisis period) in a soft way, while the period from 2012-2015 will be analysed more in specific (the period selected is referred to the QE period).

In the second part there will be the analysis of Capital Expenditures, with the analysis of what they are and all the most important characteristics, which must be known. Then will not be possible, compared to the first part, to analyse the trend of Cap. Expenditures due to the academic paper's lack on this argument (and it's not possible to make an analysis of all firm's capital expenditures).

In the last part of the chapter let's going to make the buyback's theoretical analysis and the trend of those in the last years; to understand if there are shareholder's returns by the firms.

By analysing those components let's going to be clear what are external investments (M&A), internal ones (Cap. Exp.), buybacks and how they change over time.

In the last chapter of the this paper with those information and with the analysis of those in numerical terms (of the firm selected to conduct this analysis), it's going to be possible to resolve the thesis' question, made at the beginning.

2.1 Merger & Acquisition

2.1.1 History of M&A

There are five big waves from the nineteenth century; each one of those was different and characterized by the events of its time. It's interesting how many similarities there are between the first wave and the last one, which is still in progress. The merger and acquisition are always affected by external sources which influence the firm's decisions on the strategy and operations.

Now let's going to see the five waves.

1. The railroad wave (1893-1904): this wave, in US, was influenced by the realization of the transcontinental railway system which permit vertical and horizontal integrations between the companies, like Coca-Cola or General Electric. This wave is also called as the "great merger movement", and the manufacturing sector was the main merger's sector. The railroad permit the cities to link each other easier, this permits companies to think in a "national way" despite a "local or regional way". This lead those ones to create monopoly or market dominance through the usage of scale's economies. The first examples of big horizontal integration are: Standard Oil Company of New Jersey (1899), United States Steel Corporation (1901) and International Harvest Corporation (1902).
2. The automotive wave (1918-1930): it was characterized by many vertical and horizontal integrations in the automotive, thanks to the railroad system of before and the increase in the automotive demand; but at the beginning of the period, the government started to create laws against the monopoly or more in general against the anticompetitive behaviour of the big firms. For example the Standard Oil Company, which created a monopoly, was obliged by the government to dismantle. The most important effect of this wave is the shift from monopolies (of the first wave) to oligopolies.
3. The conglomerate wave (1955-1970): this wave was caused by the Us legislation of that time, which didn't permit the horizontal or vertical integration, this lead the

companies to merge or acquire other companies of different sectors. The major player during this wave was the General Electric.

4. The mega merger wave (1980-1990): the low level of interest rate with the increase of economy condition, lead the companies to acquire with cash other companies. The operations of this time were very big compared to the previous ones, from that the mega-merger wave. The US and UK legislation changed during this period, encouraging horizontal and vertical integrations. The hostile takeovers were the most frequent actions by the acquirers; during this wave the investment banks had a significant role, but near the end of the period the bank started to limit the loans so the merger finished.
5. The globalisation wave (1993-2000): the last wave start in the 1993 until the end of millennium; this is linked to the start of the globalisation process and start of “mega deals”.

Many factors affected this wave:

- Economies of Scale: the research by the firm of economies of scale.
- The slow market growth: this lead to find other sources of growth as the mergers or the acquisitions.
- Low Interest Rate: which make the fundraising easier for the companies.
- Supply exceeds demand: this lead the companies to merge or acquire to reduce the costs for finally reducing prices.
- The reached limit: many companies at the end of millennial, achieve their limit; the only way to growth more was through the acquisitions or mergers.
- Growth of IT: this open a new communication frontier which permits the companies to become bigger over the entire world.
- Globalisation: this effect open for the companies new market and so new customers, which were before outside their range, this lead to expansion of companies through M&A.

The result of the wave is the creation of massive & multinational firms and conglomerates; the basis of this is the assumption “bigger is equal to more market’s power”. The globalisation involves foreign investors and firms, which are parts of the operation inwards and outwards.

The sectors most involved were gas and oil industry; in fact during this period there is the birth of some big firms as Exxon and Mobile or GlaxoSmithKline, or the important acquisitions made by Vodafone in Germany, or the merger between Chrysler and Daimler.

6. The sixth wave (2003-2008): the key factors of this wave are the private equity actors, the globalisation and the shareholder activism; this wave is on the recovery's period after the dotcom bubble of the first millennium's years. The favourite action was the leveraged buy out operation, due to also the low interest rates for borrowing; and the globalisation lead the company to enter in new markets to become global. The most important and famous merger was the deal between the American Online and Time Warner with a value of 164 billions of dollars. The wave ended with the start of the financial crisis on December 2007.
7. The Seventh Wave (2011-Today): this wave is leads by the Brics; the US companies started to acquire participations in cross-border firms, due to the high growth of Brazil, Russia, India, China and South Africa (Brics). The trend is positive from the 2011, with a peak of M&A activity in 2015.

2.1.2 Merger and Acquisition, What and Why

It's possible to define a merger or an acquisition as the combination (or the fusion in the case of merger) of two or more companies into a new one company or not (in the case of acquisition).

The main difference between those are that:

- The mergers are fusion between two companies into a new one. This is made because the company A and the company B see that if they merger there will be benefits for both. These are also called Synergies, and it's one of main reason for the company to merge or acquire with/a company.
- The acquisition, the acquirer, the company A, purchase the acquired or the target, the company B. This is made through the shares' acquisition by the company A; obviously to control the company, the acquirer must control the majority of the shares. The acquisition could be hostile or friendly; in the first case the target doesn't want to be acquired so the acquirer must make an hostile takeover, in the second case the

acquisition will be friendly due to the presence of an agreement between the two companies.

The reasons under a merger or an acquisition are many and various; these are divided into rationale and driver. The first one is the main reason of the operation, as a strategy of implementation, while the second is a factor which could influence the process, as the objective to obtain more “power” in the specific sector.

The main rationales are:

- Strategic: this is referred to the objective to obtain a strong strategic benefit from the merger or the acquisition, like the increase of market power or to enter in a new market and many many others. Those strategic rationales could be divided more in specific into:
 - Defensive Strategic Rationale: in this case the acquisition or the merger is made for a defensive tactic, for example with the M or A it's possible to decrease costs to defend against a new competitor.
 - Speculative Strategic Rationale: in this case the acquired is seen as a commodity, this operation is made by the acquirer for example to obtain the access to a new market or to obtain the R&D of the target.
 - Failure of Management Rationale: this happens when the management failure, the operation is made to remove the old management and to increase, in this way, the condition and the potentiality of the target.
- Financial Reason: the operation is made due to financial strategic reasons, for example if a company is losing value it could merger with a successful firm or buy a smaller one.
- Political Reason: referred to a exogenous factor as the politics, if the law change maybe you are obliged to make this kind of operation to survive.

The main drivers are, (only some of them):

- To obtain some specialists or skills: the acquisition is made to obtain the R&D of another company.

- Globalization: it could lead a company to merger or acquire another one.
- Diversification: to diversify the firm's business.
- Consolidation: could be international but also national.
- Vertical Integration: buy another company in the supply chain, it's sure the presence of cost's synergies.

In the case of acquisition or merger the integration could be:

- Vertical: if the operation is done to go forward or backward in the supply chain (cost's synergies often).
- Horizontal: if the operation is done with a company which works in the same sector or area.
- Conglomeration: if the operation is made with a company which operate in another sector or area (process of diversification).

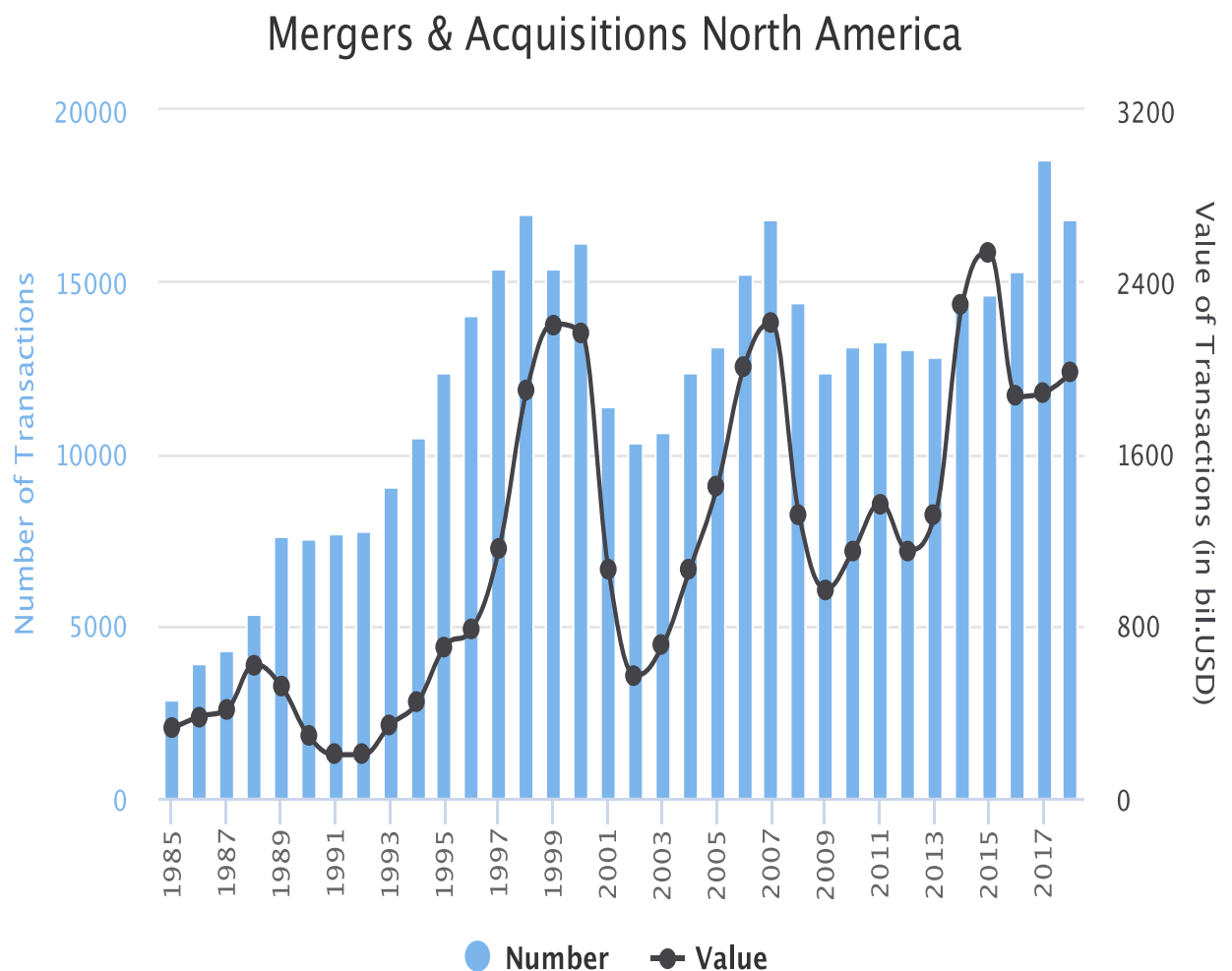
Many time the operation failure for many reasons, like:

- The agreement fail: there isn't the agreement between the two companies and between the managers of the companies involved.
- Value Overestimation: the acquirer pays, quite often, the company acquired at a higher price compared to the fair value; but many time the acquired' valuation is too high compared to the acquirer' valuation, which lead to a disagreement.
- Fail to Search Potential Synergies: many time the acquirer is not able to identify all the synergies and so it arrives to the conclusion of the operation's inconvenience.
- The acquirer is small compared to the target: sometimes, the target is too big for the acquirer, so it won't be able and have the resources to make the deal.
- Different Cultures: if there is a conflict between the two company's cultures, it's very predictable the disagreement.

2.1.3 The M&A market pre-crisis

For purpose of the paper it's important to analyse, not so specific (in general), the trend and the activity of the M&A market in the pre-crisis period, from 2003 (more or less) to 2007 (the year of crisis' beginning).

Graph 18: M&A Activity 1985-2018 (Source: IMAA Institute)



Source: IMAA analysis; imaa-institute.org

The M&A pre-crisis period is referred to 2003-2007, which correspond to the sixth wave already explained before. The main factors were the globalisation, the private equity actors and the low level of interest rates (which lead to the over-usage of leveraged buy out operations). As it's possible to see from the graph 18, from the dotcom bubble in the beginning of the millennium, the M&A market sharply rose from 2003 to 2007; in that years the total number of transaction raise from 10674 (2003) operations to 16802 operations

(2007)! The total value as the same path from the 710 billions of dollars (2003) to the 2206 billions of dollars (2007)!

Graph 19 : US, Total number of transactions and values of them (Source: IMAA Institute)

Year	Number	Value
1985	2904,00	325,00
1986	3935,00	378,00
1987	4297,00	413,00
1988	5346,00	620,00
1989	7620,00	516,00
1990	7582,00	286,00
1991	7689,00	200,00
1992	7767,00	201,00
1993	9047,00	339,00
1994	10510,00	445,00
1995	12393,00	704,00
1996	14035,00	787,00
1997	15386,00	1165,00
1998	17013,00	1892,00
1999	15424,00	2203,00
2000	16168,00	2167,00
2001	11381,00	1066,00
2002	10333,00	569,00
2003	10674,00	710,00
2004	12367,00	1065,00
2005	13154,00	1447,00
2006	15262,00	2009,00
2007	16802,00	2206,00

The graph 19 is the representation of the total transactions and of the total values; it's easy to see the growth path from 2003 to 2007 (the sixth wave).

2.1.4 The M&A market post-crisis

This part of the paper is going to describe the M&A activity from 2012 to 2015 in the US (the peak of the M&A market related to all the transaction value).

Graph 20: US, Transaction and Value of M&A market, 2012-2015 (Source: IMAA Institute)

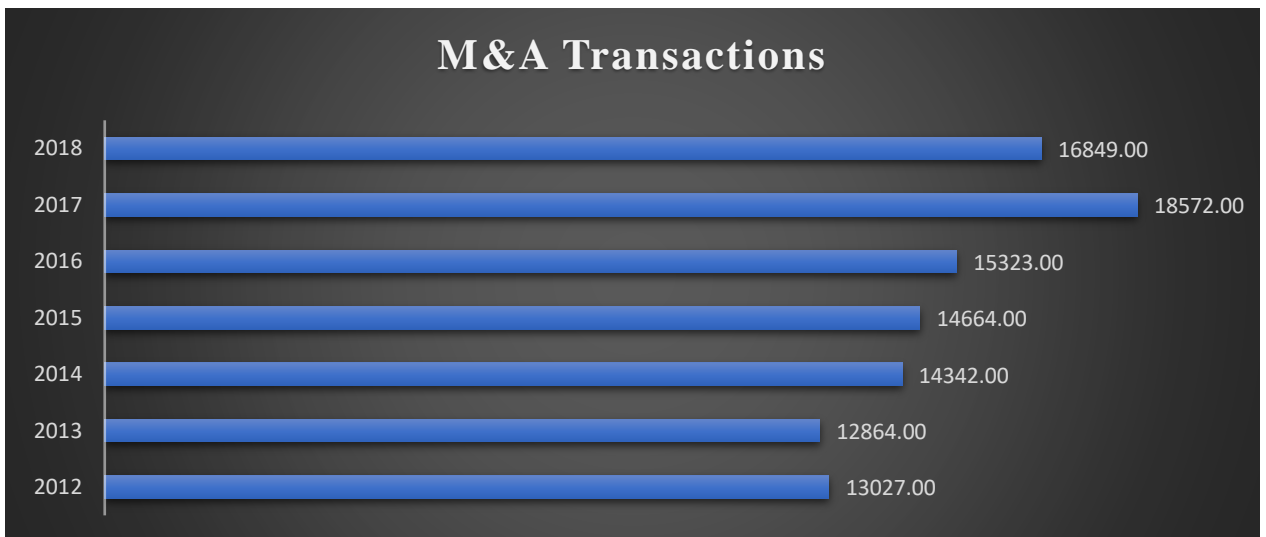
Year	Transactions	Value
2012	13027,00	1153,00
2013	12864,00	1311,00
2014	14342,00	2292,00
2015	14664,00	2533,00
2016	15323,00	1866,00
2017	18572,00	1884,00
2018	16849,00	1975,00

As it's possible to see the M&A market in the last has a positive path, related to the transaction, with a peak of 18572 in 2017 and a little decrease in 2018 with a total of 16849 transaction.

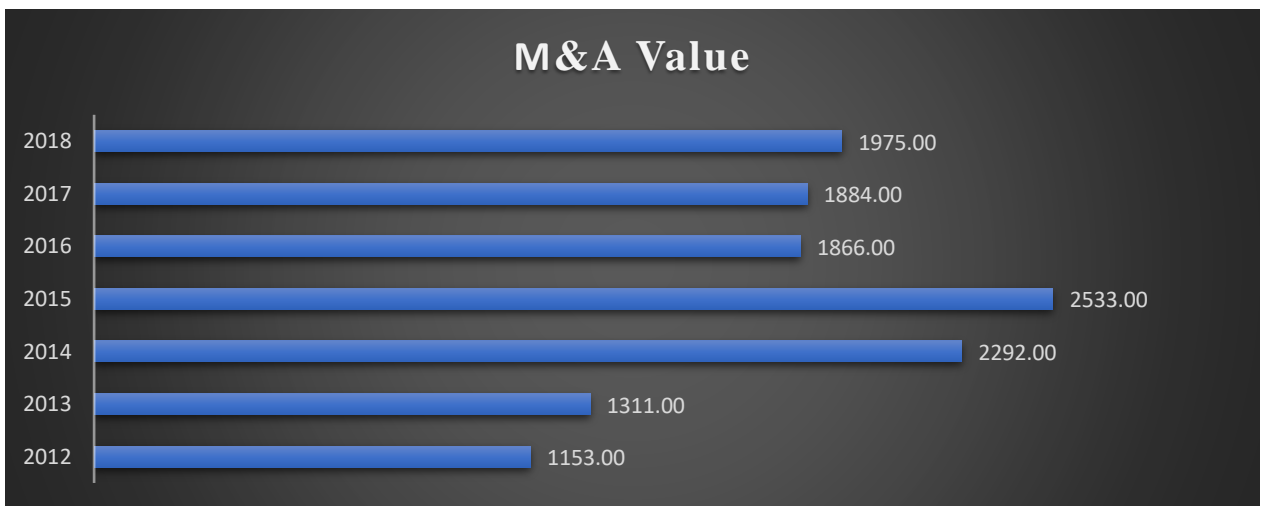
Regard the value of the transactions, there is a first growth from 2012 to 2015, with a peak of 2533 billions of dollars! After that point there is fall by 26% in 2016 (from 2533 to 1866 billions); and a successively growth in 2017 and 2018, even if not so strong as from 2012 to 2015.

The graph 21 and 22 highlight better what said before.

Graph 21: US, M&A market transactions, 2012-2015 (Source: IMAA Institute)



Graph 22: US, M&A market values, 2012-2015 (Source: IMAA Institute)

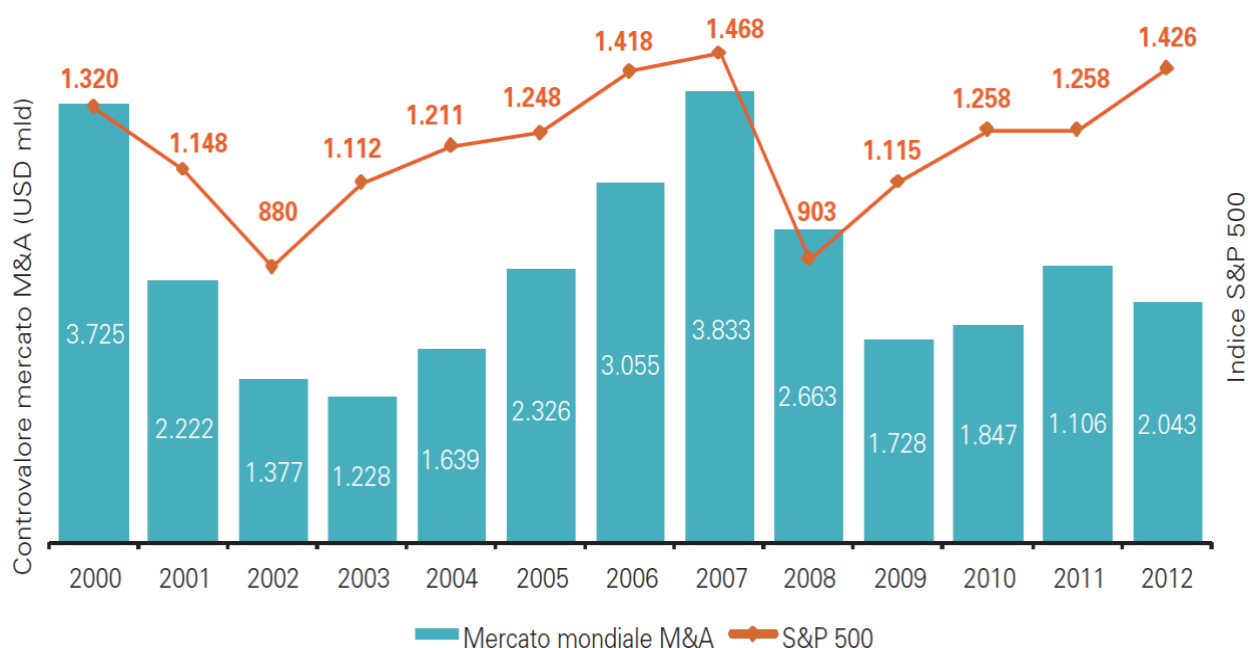


After seen the general trend of the market, it's time to see more in specific each year, from 2012 to 2015; this analysis will include the analysis of the worldwide M&A activity, the biggest transactions in Us and which sector affects.

2.1.4.1 The M&A market in 2012, World and USA

In the 2012 the M&A market activity worldwide, had a decrease in value of 13% (from 2166 billions of 2011 to the 2044 billions of 2012) and in transaction of 5% compared to the 2011⁸⁴. The Kpmg report showed a positive correlation between the value of the M&A activity and the path of S&P 500 index. As it's possible to see in the graph 23.

Graph 23: Value of M&A Activity 2012 and S&P 500 index (Source Kpmg report, 2012)



In the graph it's easy to see the fall of the M&A market during 2008/9/10, after the financial crisis, caused by the decrease of investor's confidence which start the downward trend of the activity from 2008 to 2010, more or less.

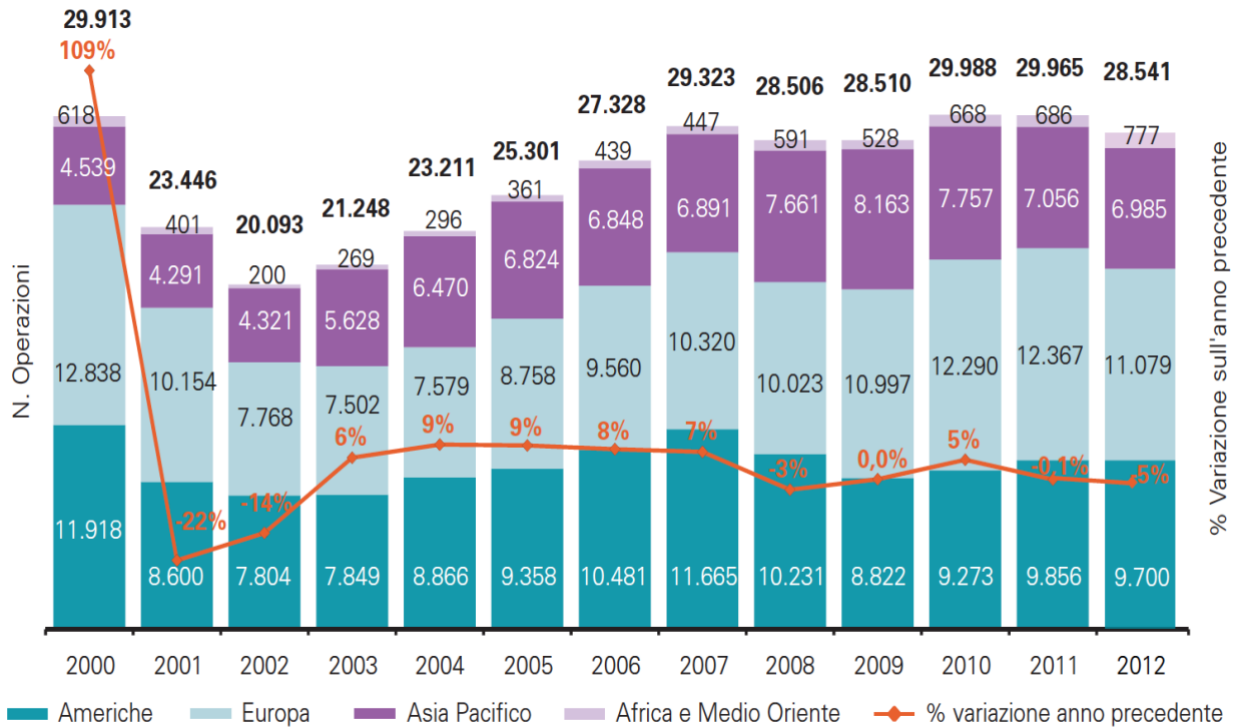
In the 2012 there were a total of 388 transactions with a value over the billion of dollars (a decrease of 7% compared to the previous year), with a value of 1244 billions (-15% compared to 2011)⁸⁵.

There were also 15 transactions with a value over 10 billions; downward trend compared to the 17 transaction of 2011 or the 25 of 2009! The value of the first ten operations was equal to 189 billions, higher compared to the 182 billions of 2011 but lower respect the 209 billions of 2010.

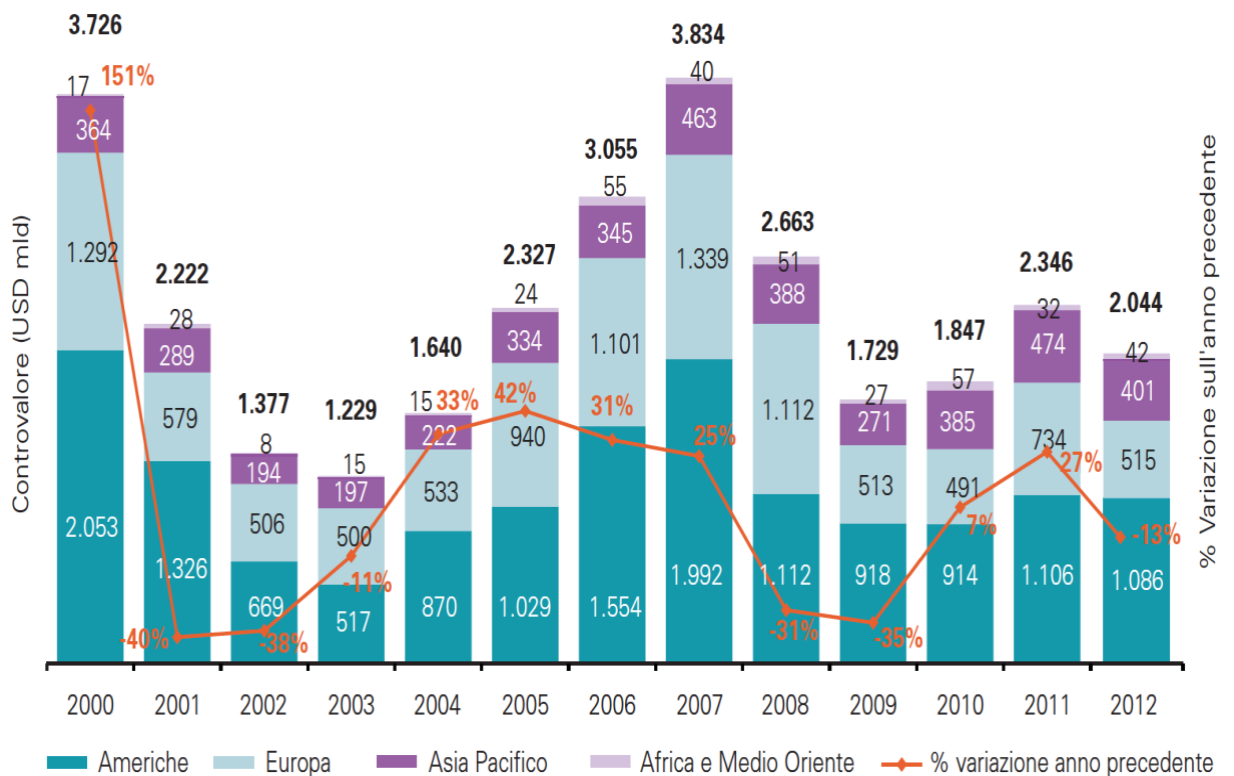
⁸⁴ Kpmg M&A report, 2012

⁸⁵ Ibidem

Graph 24: Transactions M&A, 2000-2012 with target's geographic area (Source Kpmg report, 2012)



Graph 25: Value M&A, 2000-2012 with target's geographic area (Source Kpmg report, 2012)



From the analysis of the sector more involve in the M&A activity, the Consumer Markets is the sector with more activity, followed by the Industrial Markets (second), the Information and Communication (Third), the Financial Services (Fourth) and Support Services and Infrastructure (last)⁸⁶.

The decrease seen in 2012 is caused by the fall of cross-border M&A activity, the value had a decrease of 27% compared to 2011! The only area with a relevant increase is the Private Equity and other Financial Investors, with a rise up by 7% of total transaction volume.

In the graph 26, which represents the top ten operations of 2012, is possible to see the relevance of the Consumer Markets for the M&A activity; but it's also possible to see the value growth from 2011 to 2012 despite the less transactions made with a value over 10 billions.

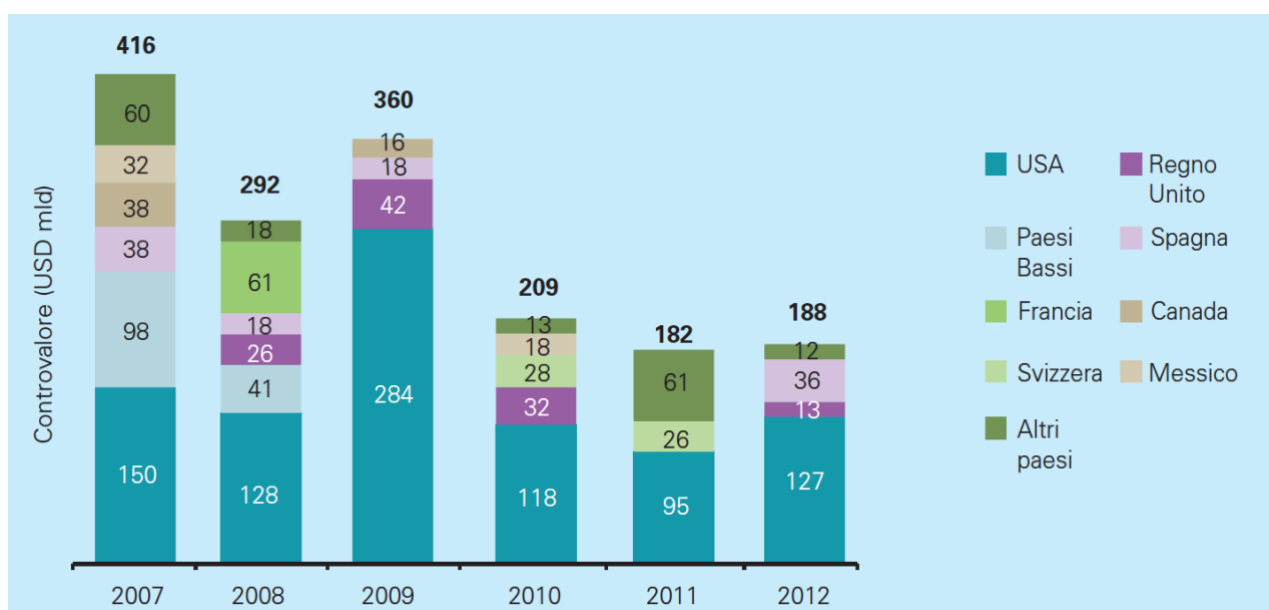
Graph 26: Top Ten Operations related to the sector (Source Kpmg report, 2012)



From a geographic perspective the USA remain was still the motherland for M&A activity as it's possible to see from the graph 26.

⁸⁶ Kpmg M&A report, 2012

Graph 27: Top Ten Operations related to the geographic area (Source Kpmg report, 2012)



The American leadership is evident (see graph 26), with the 53% of value of total M&A market value! (in 2011 this value was equal to 47%)

In 2012 the value reach the 1086 billions of dollars with 9700 transactions completed, with a little decrease of 2% compared to 2011 both in value and total amount of transaction.

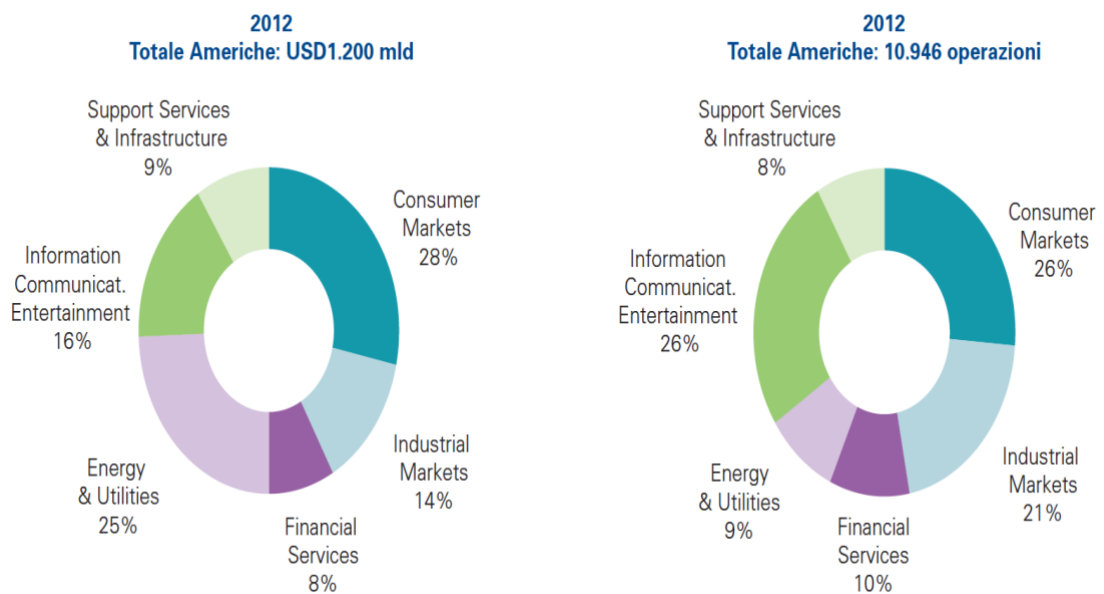
The M&A activity cross-border felt by 21% compared to 2011, with a sharply rise up of the domestic market; it's easy to see that from the graph 27.

Graph 28: Top deals in US (Source Kpmg report, 2012)

Target	Nazione Target	Bidder	Nazione bidder	Quota	Valore USD mld
Medco Health Solutions Inc	USA	Express Scripts Inc	USA	100,0%	29,4
Progress Energy Inc	USA	Duke Energy Corp	USA	100,0%	25,8
El Paso Corp	USA	Kinder Morgan Inc	USA	100,0%	24,0
Synthes Inc	USA	Johnson & Johnson	USA	100,0%	20,1
Goodrich Corp	USA	United Technologies Corp	USA	100,0%	16,2

As it's possible to see in the graph 28 there is the leadership of Consumer Markets, compared to the Information, Communication & Entertainment of 2011. The first market rises up by 28% in 2012 compared to 2011 and the Energetic Markets too had a sharply growth of 23% compared to 2011.

Graph 29: M&A activity, American Market, related to the Sector (Source Kpmg report, 2012)



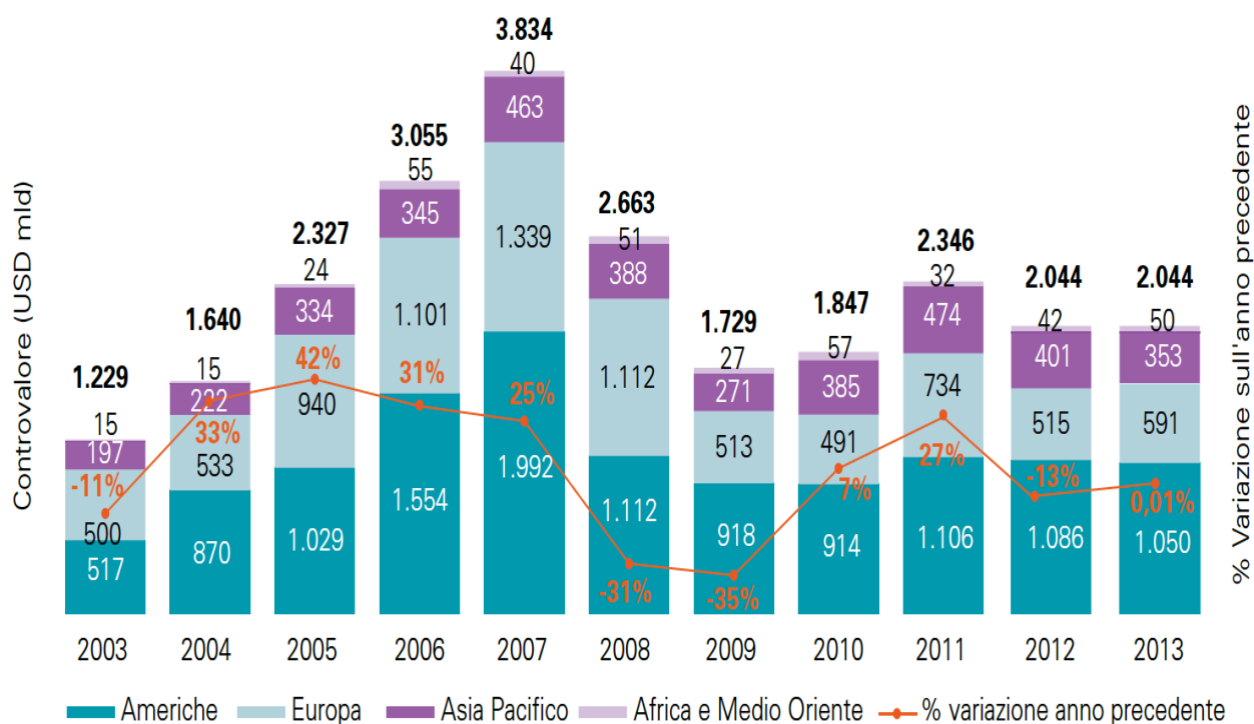
2.1.4.2 The M&A market in 2013, World and USA

In 2013 the M&A market, even if the lower number of transactions from 28500 of 2012 to the 27387 of 2013 (a fall by 4%), had the same value of 2044 billions. The 60% of the total value is referred to operation over one billions of dollars (354 big deals, with a weighted value equal to 2012, but the total transactions fall by 9%), and the value of the first ten operation is equal to 12%!⁸⁷ There was a strong process of consolidation in some industries as Consumer Markets and the Services & Infrastructure one.

The private equity and financial investors had a significant role in this process, with 5700 operations completed and three operation with a value over 10 billions⁸⁸.

This year was the “IPO year”, with 843 collocations on the market and with a value of 164 billions of dollars⁸⁹.

Graph 30: Value M&A, 2003-2013 with target's geographic area (Source Kpmg report, 2013)

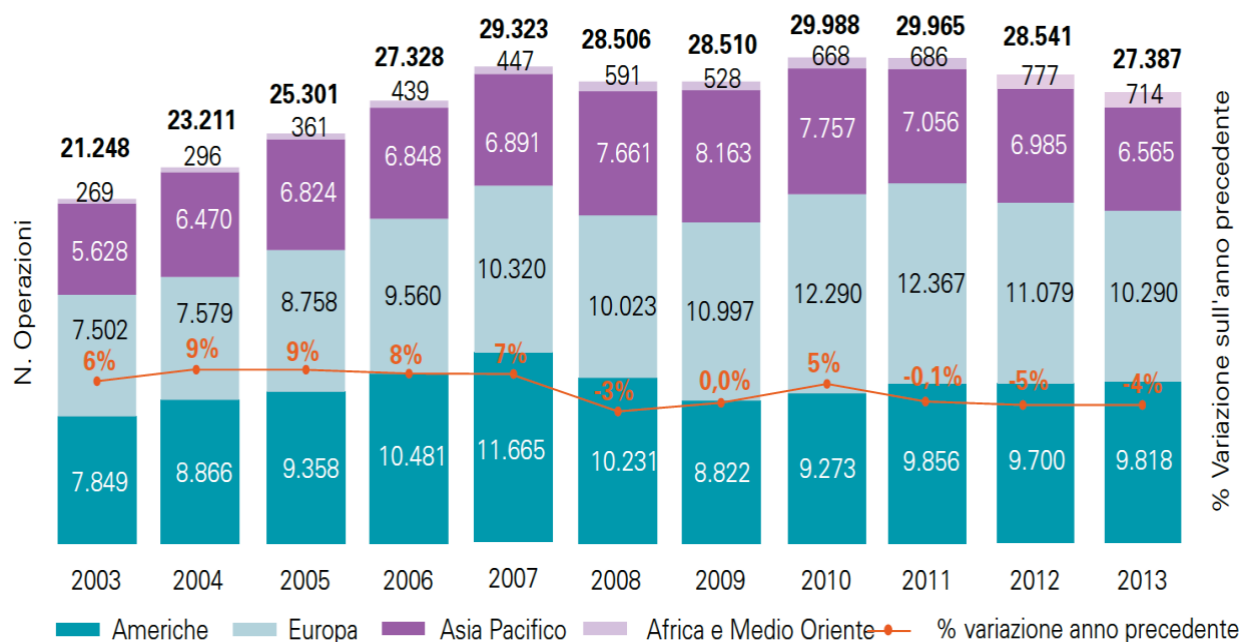


⁸⁷ Kpmg M&A report, 2013

⁸⁸ Ibidem

⁸⁹ Ibidem

Graph 31: Transactions M&A, 2003-2013 with target's geographic area (Source Kpmg report, 2013)



The sector most involved, in terms of total transactions and value, are the Technologic sector, the Pharmaceutical one and telecommunications.

In 2013 there were 339 operations with a price between 1 and 10 billions, with a total value of 871 billions (there is a fall by 6% compared to 2012)⁹⁰.

The Consumer Markets is still the first sector for total transactions and value, the second is the Information and Communication followed by the Energy & Utilities; in the graph 31 is possible to see it.

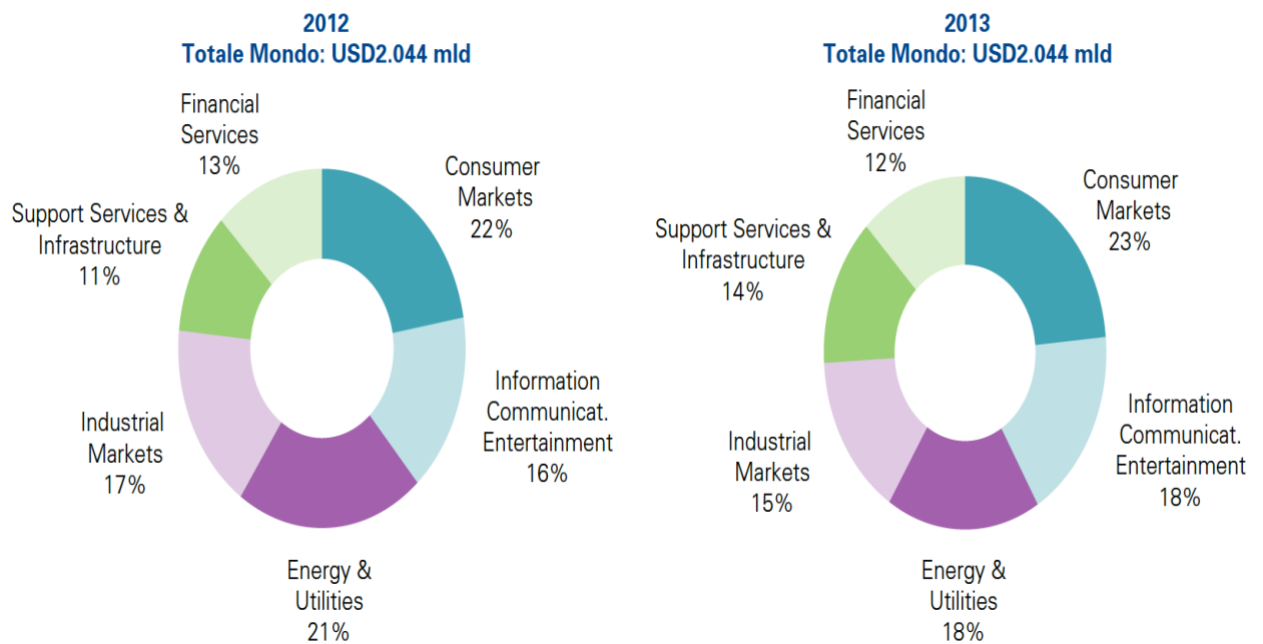
In 2013 there is still the downward path of cross-border activity with a value of 38% compared to the 43% of 2012; however there is growth of M&A activity by the financial investors and the private equity, with 5676 operation completed and a total value of 516 billions (+8% compared to 2012)⁹¹.

It's interesting for what just said, the acquisition of Heinz by the 3G Capital Partners and Berkshire Hathaway Inc. (two of major private equity funds) of Warren Buffet for 23,5 billions of dollars.

⁹⁰ Kpmg M&A report, 2013

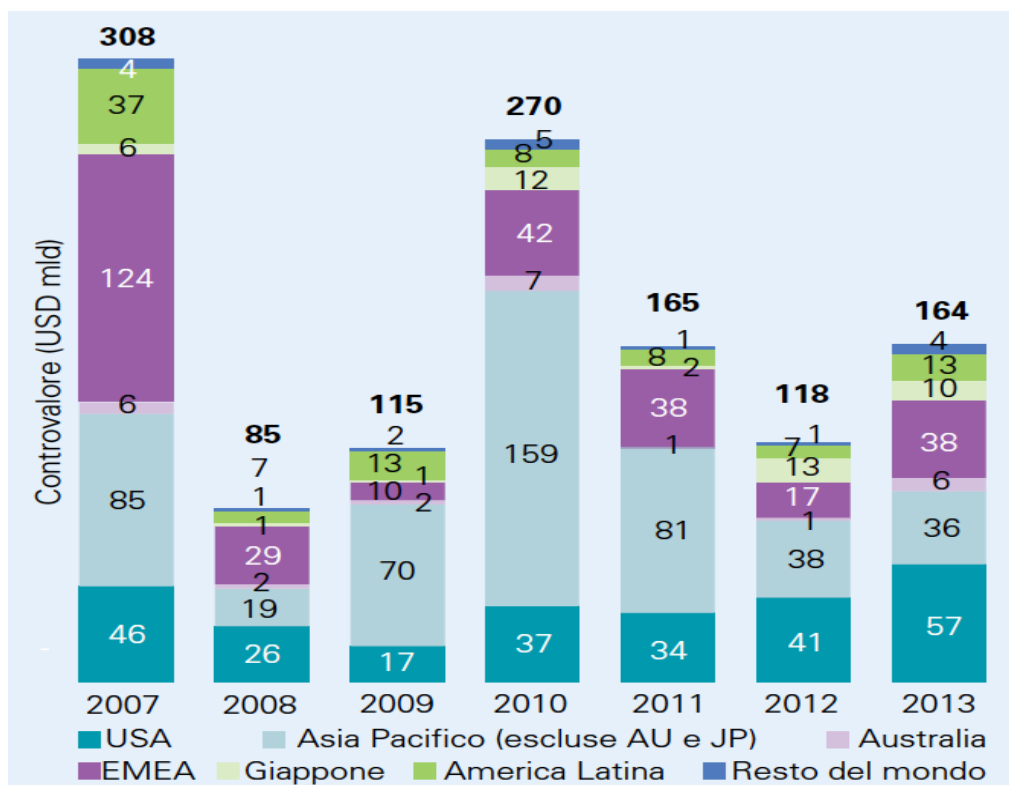
⁹¹ Ibidem

Graph 32: M&A activity, World, related to the Sector (Source Kpmg report, 2013)



In the 2013 there were a lot of IPO compared to the 2012 (more or less the same in 2011, even if very far from the 2007 levels).

Graph 33: IPO, world, 2007-2013 (Source Kpmg report, 2013)

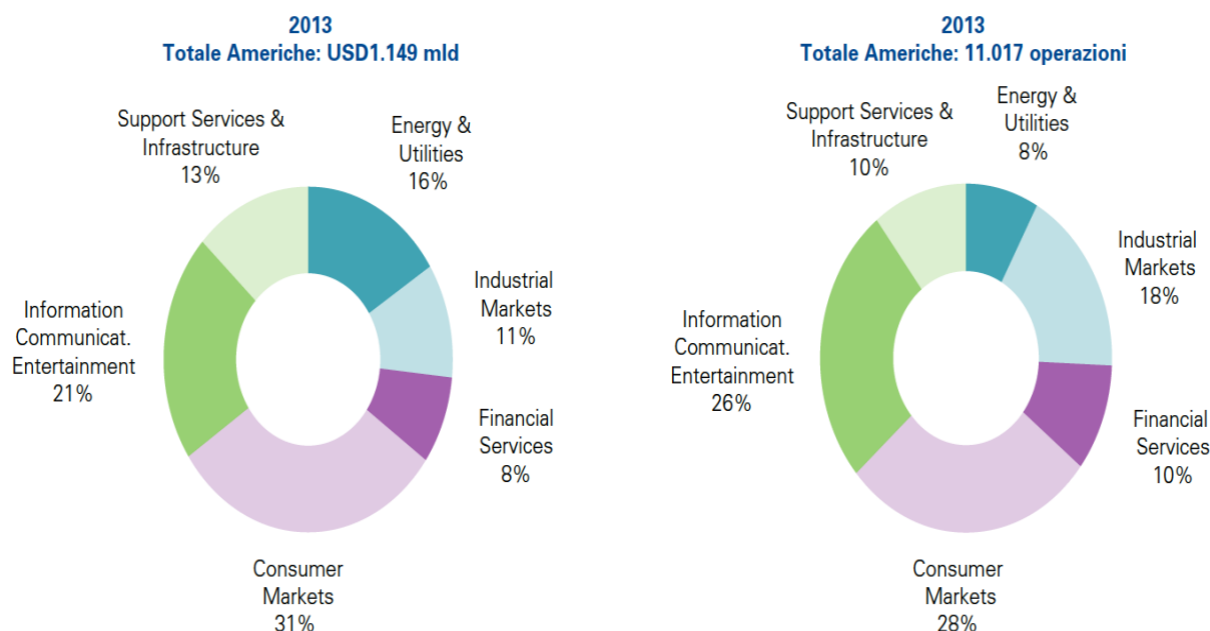


In the 2013 the US (and for a little Canada and Mexico) with 9818 transactions completed (36% of total world transactions), 1% more compared to 2012, and a value of 1050 billions of dollars (51% of total world value), -3% compared to 2012, is still the centre of M&A activity. In fact ten out of fifteen of mega deals (the first 15 operations in the world) are in the US (and Canada/Mexico)⁹².

Graph 34: Top five deals in America (Source Kpmg M&A report, 2013)

Target	Nazione Target	Bidder	Nazione Bidder	Quota	Valore USD mld	Data
HJ Heinz Co	USA	Gruppo di investitori, comprendente Berkshire Hathaway Inc e 3G Capital Partners Ltd	USA / Brasile	100,0%	23,5	07-06-13
Sprint Nextel Corp	USA	SoftBank Corp	Giappone	78,0%	21,6	10-07-13
Dell Inc	USA	Gruppo di investitori, comprendente Silver Lake Partners e Denali Intermediate Inc	USA	86,6%	21,5	29-10-13
Nexen Inc	Canada	CNOOC Canada Holding Ltd (Gruppo CNOOC China National Offshore Oil Corp)	Canada/ Cina	100,0%	19,1	25-02-13
Grupo Modelo SAB de CV	Messico	Anheuser-Busch Mexico Holding S de RL de CV (Gruppo Anheuser-Busch Inbev)	Messico / Belgio	44,5%	18,0	04-06-13

Graph 35: M&A activity, American Market, related to the Sector (Source Kpmg report, 2013)

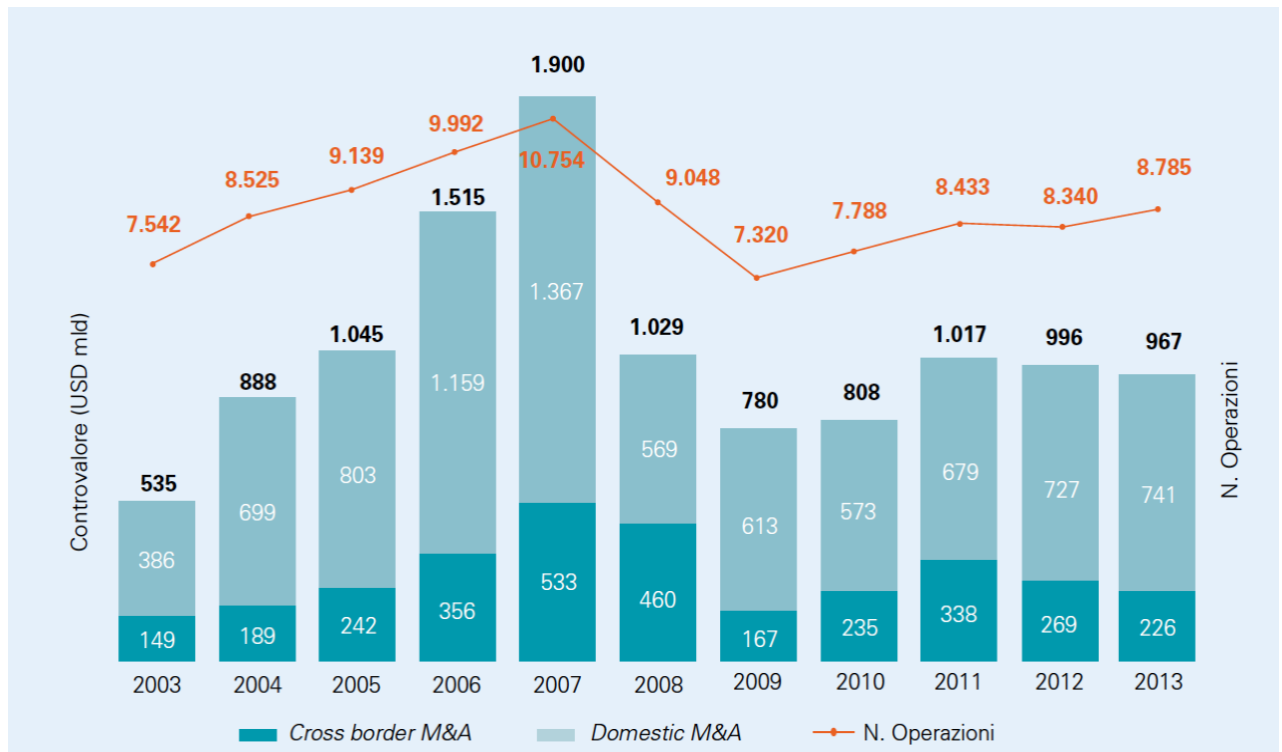


The segmentation by sector of American Market follow the world path (Graph 31), as it's possible to see in graph 34.

⁹² Kpmg M&A report, 2013

The 2013 has disregarded expectations, the investors believed in the renaissance of M&A market but despite the little growth of domestic market it didn't "reborn" as expected⁹³; it's possible to see it in graph 35.

Graph 36: Domestic and Abroad M&A activity, 2003-2013 (Source Kpmg report, 2013)

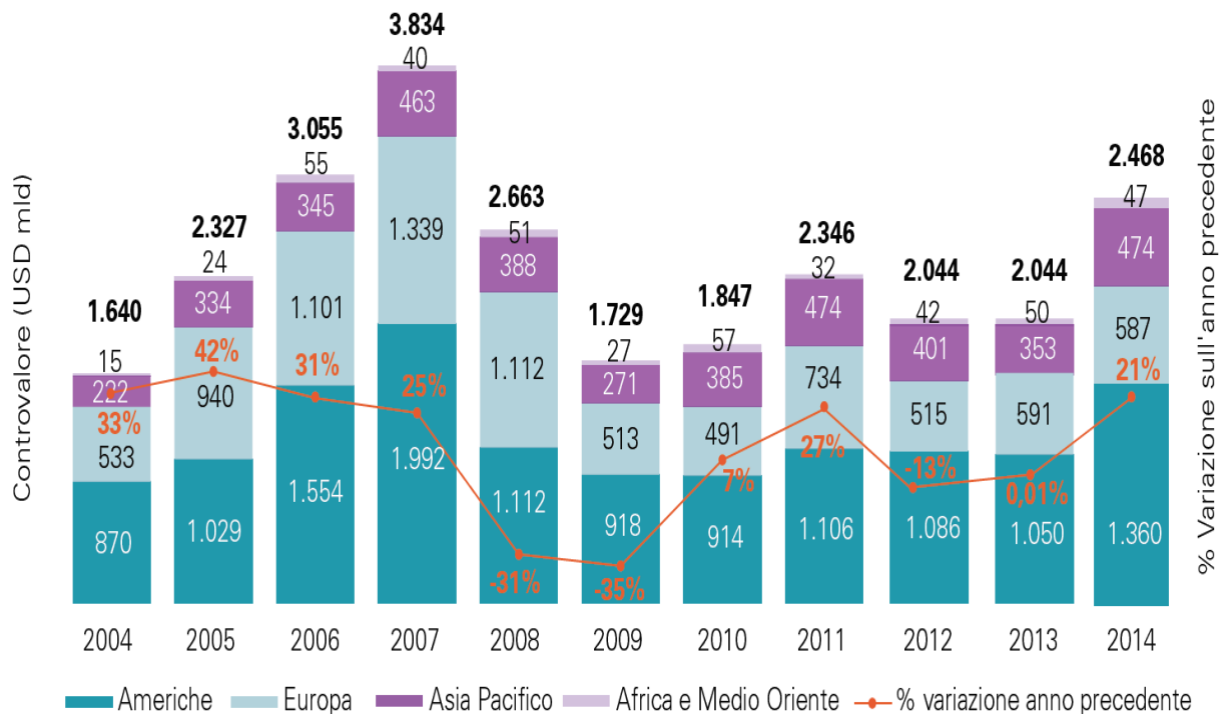


⁹³ Kpmg M&A report, 2013

2.1.4.3 The M&A market in 2014, World and USA

The 2014 is the year of M&A activity with 29758 operations completed (+9% compared to 2013) and a value of 2468 billions of dollars (21% compared to 2013)! Those are the highest numbers related to the previous years, only 2007 is higher in numbers terms. This explosion is linked to the growth of the M&A market in Asia (+34%) and America, more in specific of USA (+32% value, +11% Transactions)⁹⁴.

Graph 37: Value M&A, 2004-2014 with target's geographic area (Source Kpmg report, 2014)

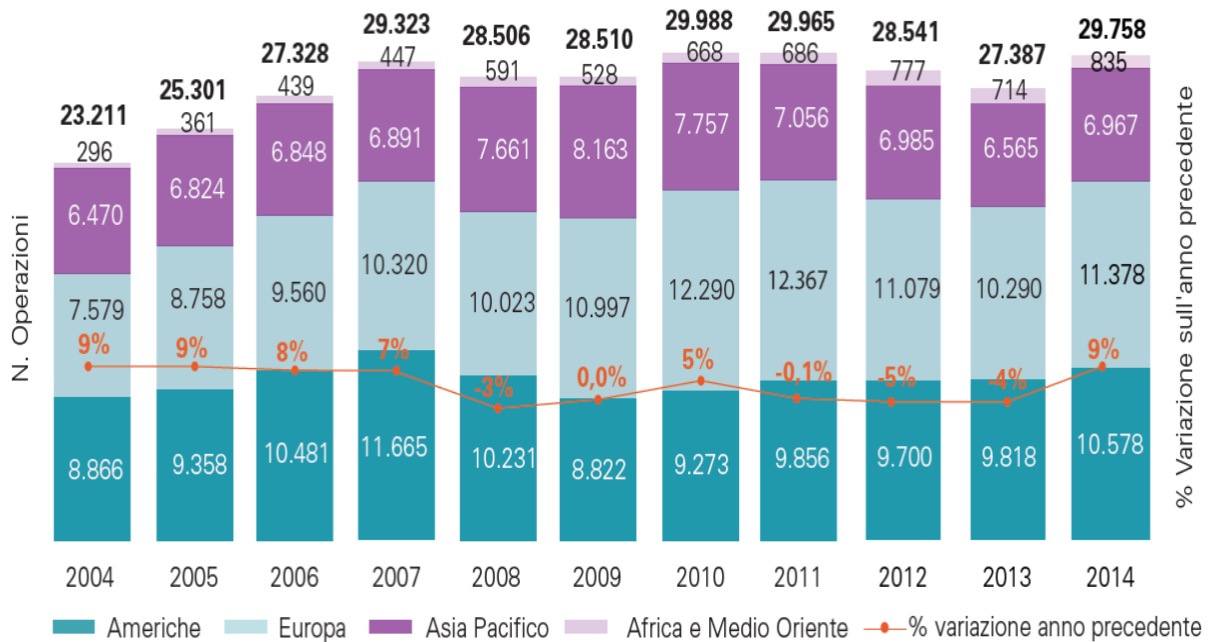


In 2014 there was a growth in the transaction values, this mean the investor's will in investing in quality rather than in quantity. The operations between 1-10 billions rise up by 27%, both in value and transactions, with 430 deals and a total ending value of 1107 billions of dollars⁹⁵. In the big deal (over 10 billions transaction) there was a rise up in value by 16% compared to 2013, 428 billions, despite the same transaction volumes. The value of the first ten operations was over 350 billions, with a market quote of 14%.

⁹⁴ Kpmg M&A report, 2014

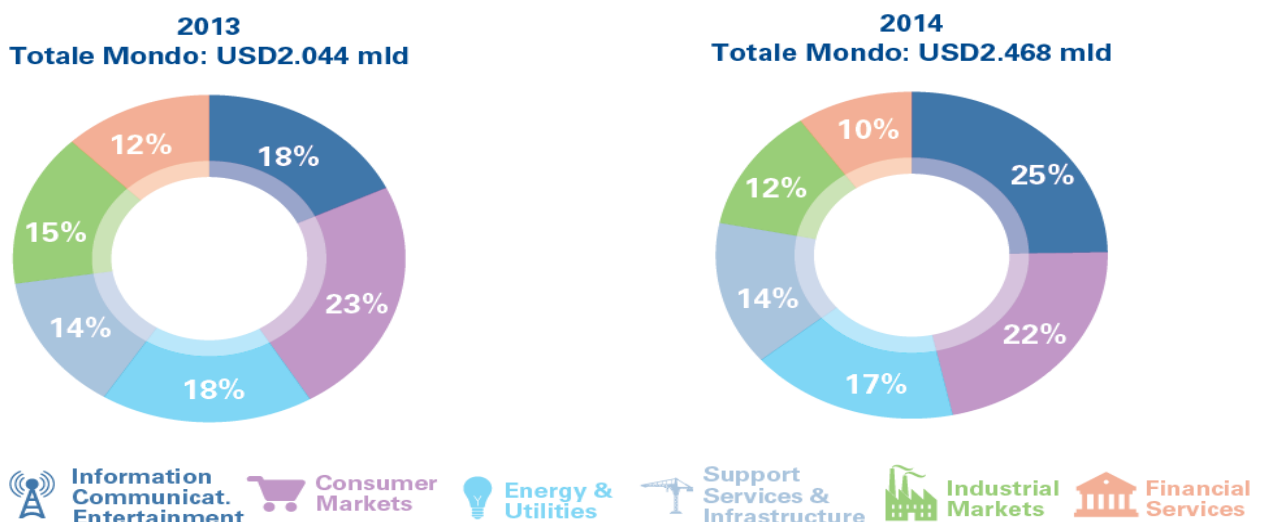
⁹⁵ Ibidem

Graph 38: Transactions M&A, 2004-2014 with target's geographic area (Source Kpmg report, 2014)



The sector with the highest number of transactions are, as in 2013, the Pharmaceutical one and the Telecommunication & Media one. Regard the value of the transactions the Consumer Markets became second (541 billions), replaced by the Information Communication & Entertainment sector (610 billions); Energy and Utilities sector closed the podium (427 billions).

Graph 39: M&A activity per sector, world, compared 2013 to 2014 (Source Kpmg report, 2014)



The M&A activity cross-border, during 2014, rise up by 15% in transactions and by 44% in values compared to 2013, this is one of the basis for the market recovery; also the domestic demand growth, even if not as well as the cross-border (+11% value, +7% operations)⁹⁶.

The financial and private equity investors had a central role for this market growth , with 7299 operation completed (+29% compared to 2013) and a value of 718 billions (+39% compared to 2013)⁹⁷; even if there was a big distance with the numbers of 2007⁹⁸.

The total activity of those investors increase by 23% in America respect the 2013.

In America the M&A market growth, as in the world, with 10578 operations (+8% respect 2013) and a value of 1360 billions (+30% respect 2013!)⁹⁹; these are the best numbers registered in the last years, second only to the 2007 ones.

The market growth thanks to many factors as: the low cost of capital, the huge amount of firm's liquidity available, the equity's growth, the huge value of equity (connected with the rise up of market index, as Dow Jones or Nasdaq) and the role of private equity fund, which with their liquidity pump the market. The 70% of total market value (American value) is related to the domestic market, with a rise up of 37% compared to 2013; while the cross-border growth of 40% compared to 2013, with a final value of 452 billions¹⁰⁰. It's possible to see it in the graph 39.

During 2014, as in the 2013, nine out of fifteen mega deals (over 10 billions of value) are referred to United States.

Graph 40: Top operations in USA, 2014 (Source Kpmg report, 2014)

Target	Nazione Target	Bidder	Nazione Bidder	Quota	Valore USD mld
Verizon Wireless Inc	USA	Verizon Communications Inc	USA	45,0%	130,3
Kinder Morgan Energy Partners LP *	USA	Kinder Morgan Inc	USA	88,3%	52,2
Kinder Morgan Management LLC				100,0%	
El Paso Pipeline Partners LP				57,9%	
Forest Laboratories Inc	USA	Actavis PLC	Irlanda/USA	100,0%	25,4
WhatsApp Inc	USA	Facebook Inc	USA	100,0%	19,5
Life Technologies Corp	USA	Thermo Fisher Scientific Inc	USA	100,0%	15,5

⁹⁶ Kpmg M&A report, 2014

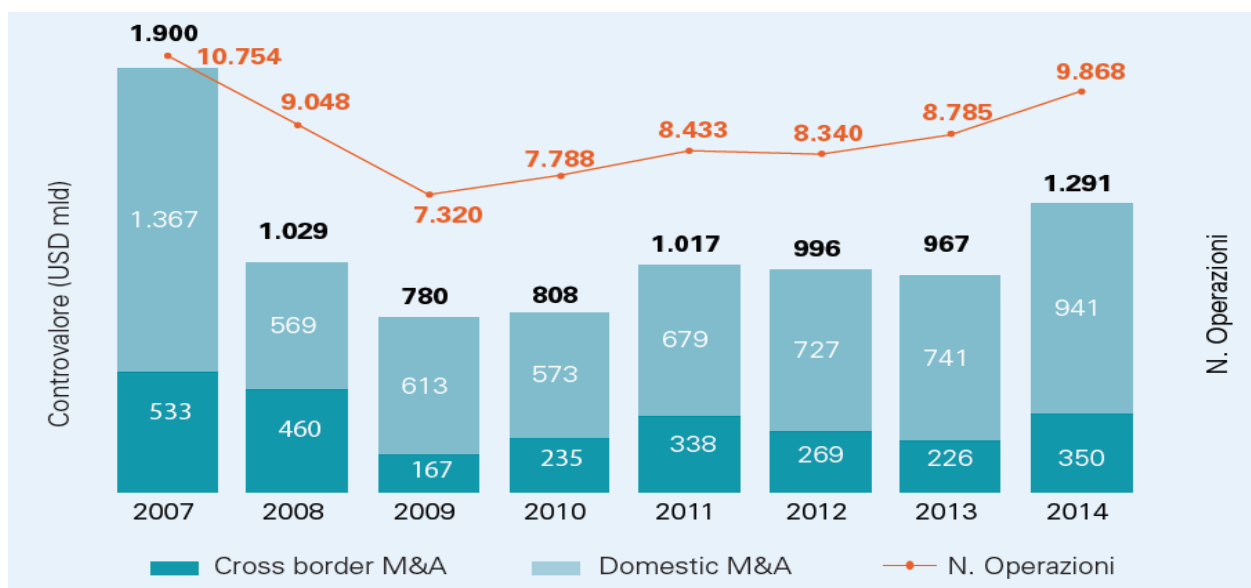
⁹⁷ Ibidem

⁹⁸ Ibidem

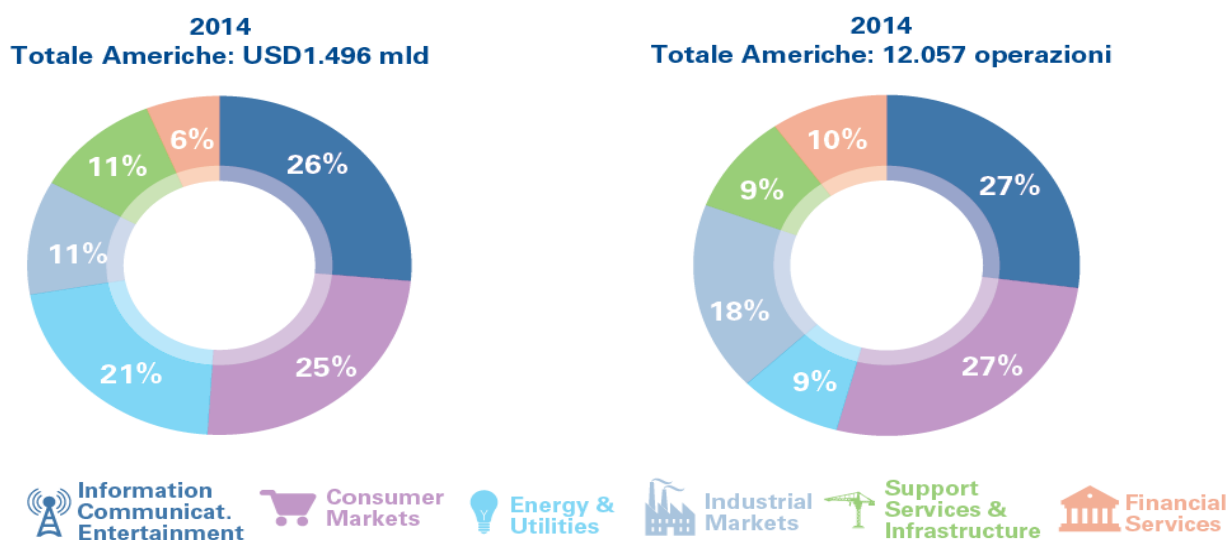
⁹⁹ Ibidem

¹⁰⁰ Ibidem

Graph 41: Domestic and Abroad M&A activity, 2007-2014 (Source Kpmg report, 2014)



Graph 42: M&A activity per sector, America, transactions and values (Source Kpmg report, 2014)



In 2014 the American market M&A activity per sector followed the world's activity, as is possible to see in the graph 40. Information, Communication & Entertainment with 396 billions value (+61% respect 2013) lead the group followed by the Consumer Markets (367 billions, same value compared to 2013) and by Energy & Utilities Markets (318 billions, +74% of value respect 2013)¹⁰¹.

¹⁰¹ Kpmg M&A report, 2014

2.1.4.4 The M&A market in 2015, World and USA

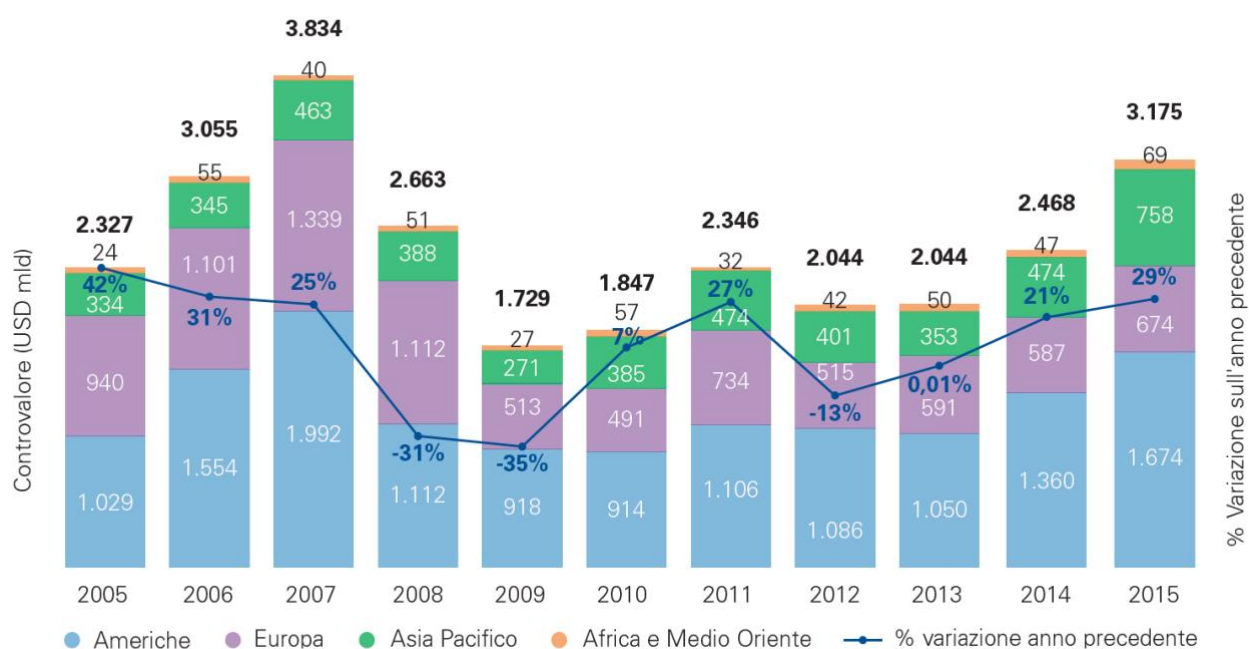
In 2015 the M&A market made new records, with 31521 operation completed (+6% compared to 2014) and a value of 3175 billions (+29% compared to 2014); not so far from the 3834 billions of 2007, the peak of all time for the M&A market¹⁰². This numbers thank the low cost of capital and the market stability over the period.

The “mega deals” (operations over 10 billions) are reduplicated compared to 2014, with a value of 880 billions (in 2014 this value was of 425) and 37 M&A operations (in 2014 there were 15 operations).

In 2007 the “mega deals” were 45 with a value of 1000 billions¹⁰³! The value of the “normal deal” (operation with a value between 1 and 10 billions) was of 1364 billions, with an increase of 23% compared to 2014 (those operations represent the 43% of the total M&A market).

During the 20145 the medium value of the operations was 101 millions of dollars compared to the 84 of 2014; in particular, the first ten operations involved 343 billions, equal to the 11% of the total market value (the first three operation involved the 43% of that 343 billions)¹⁰⁴.

Graph 43: Value M&A, 2005-2015 with target's geographic area (Source Kpmg report, 2015)

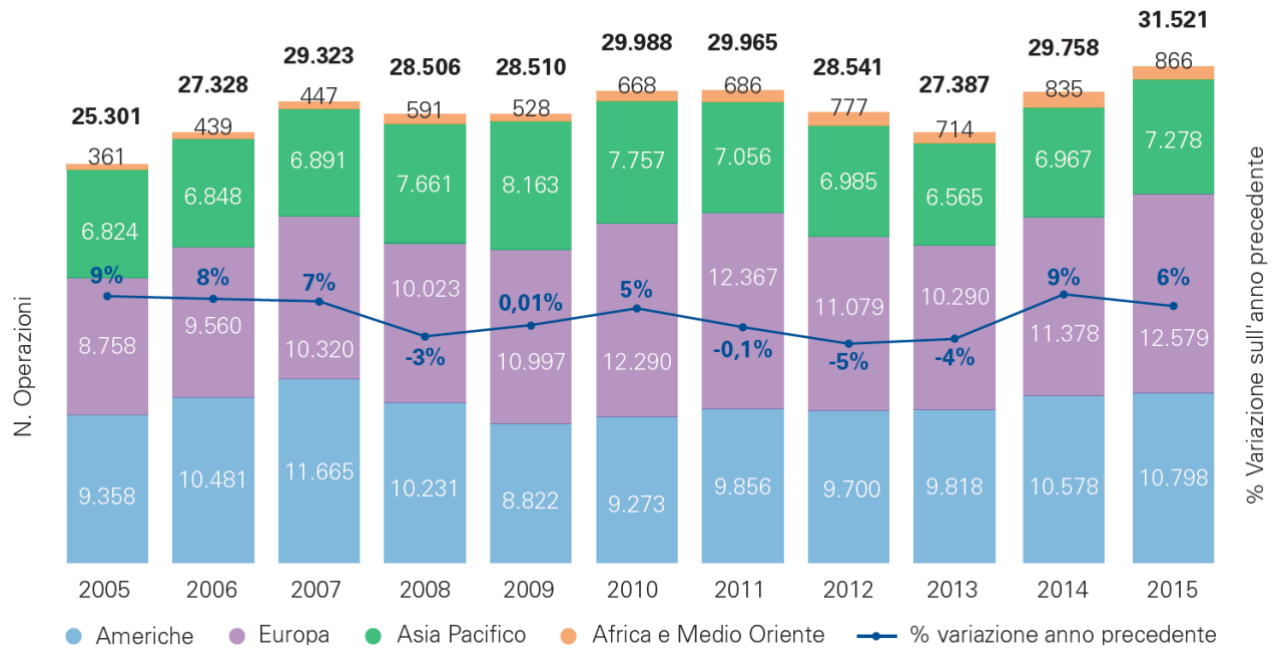


¹⁰² Kpmg M&A report, 2015

¹⁰³ Ibidem

¹⁰⁴ Ibidem

Graph 44: Transactions M&A, 2005-2015 with target's geographic area (Source Kpmg report, 2015)



In the graph 43 it's possible to see the new record made by the Asian market with the transactions value of 758 billions (+60% compared to 2014), and also of the African one with a value of 69 billions (+47% respect 2014).

There is also the increase of the American markets with 1674 billions (+23% compared to 2014); and a raise of USA market by 32%, higher compare to the American one. This market lead the M&A sector with a share of 53% of total transactions value.

There is a growth also in the domestic demand, +33% of value compared to the previous year, and in the cross-border activity, +27% in value and +8% in volume.

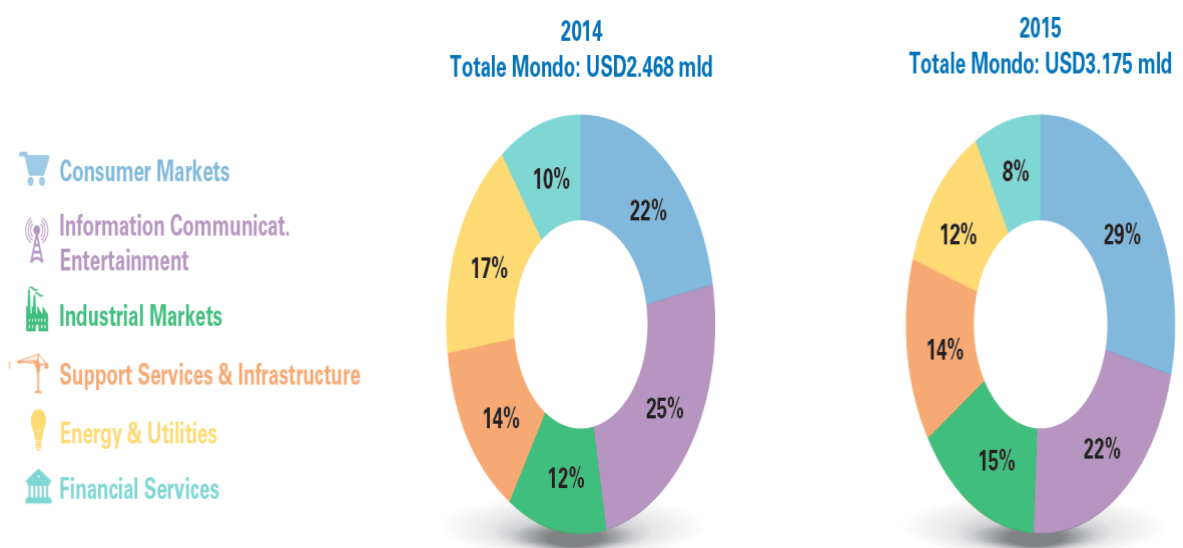
If it's take under consideration the various sectors¹⁰⁵:

1. Consumer market: with 918 billions of value and 9236 made (a new record for this sector, with a rise up by 70% compared to 2014), it took the first place among the contributor to the M&A market.
2. Information, Communication & Entertainment market: at the second place as contributor, there is this sector with 706 billions of value (+16% compared to 2014) and 7827 deals completed (+8% respect 2014).

¹⁰⁵ Kpmg M&A report, 2015

3. Industrial market: at the third place with 474 billions (+70% of growth) and 5907 transaction.
4. Support Services & Infrastructure market: 444 billions of value (+26% compared to the previous year and 3279 operations made.
5. Energy & Utilities market: the only sector with a decrease, 385 billions of value (-10% compared to 2014).
6. Financial Services market: the sector with the lowest value, 247 billions.

Graph 45: M&A activity per sector, world, compared 2014 to 2015 (Source Kpmg report, 2015)



Also the financial and private equity investors had a significant role in this market, with 8025 operations (+10% respect 2014) and a value of 866 billions (+21% compared the previous year); the number of transaction represent new record for the sector (higher to the peak of 1999), while the number of total value involved is second only to the value of 2007, 1077 billions¹⁰⁶.

Those numbers contributed for a 27% of total M&A market value (29% in 2014), and for a 25% of volume (24% in 2014).

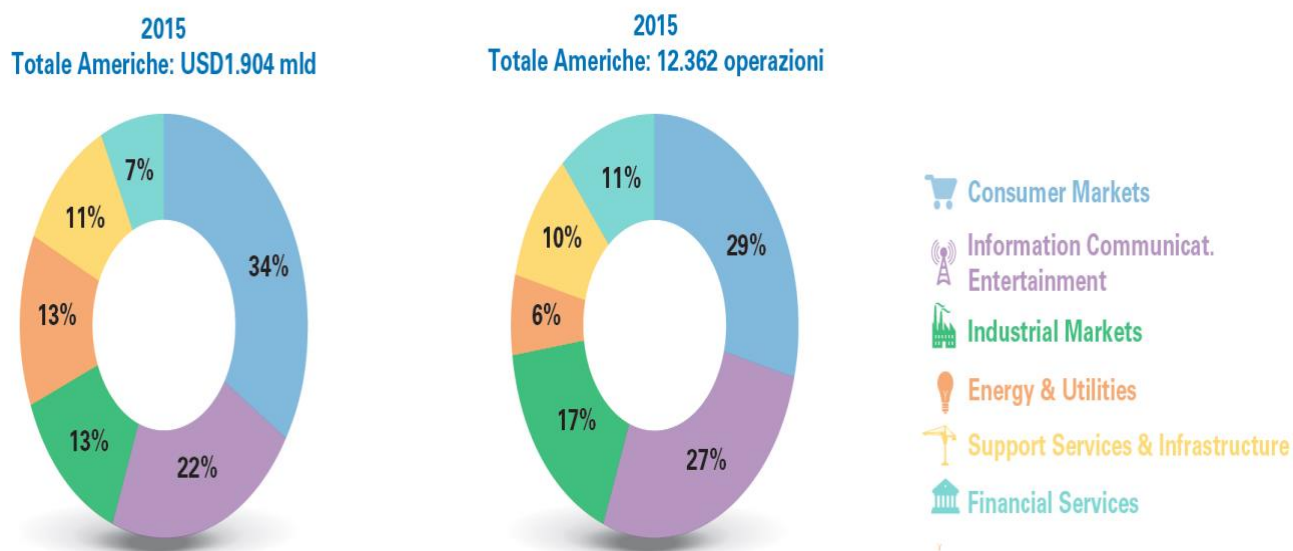
The total American market contributed for a 53% of total M&A market and for a 34% regard the volumes. The total value of that market is 1674 billions (+23% on 2014) with 10798 transactions completed (+2% on 2014)¹⁰⁷. The USA represents the 89% of the total American M&A activity.

¹⁰⁶ Kpmg M&A report, 2015

¹⁰⁷ Ibidem

The domestic market growth of 26%, compared to 2014, with a total value of 1332 billions; the cross-border market growth of the same points with a value of 572 billions. On 20 mega deals, 13 of that are related with US firms as target or bidder¹⁰⁸.

Graph 46: M&A activity per sector, America 2015, transactions and values (Source Kpmg report, 2015)



The Consumer Markets, thanks to the Pharmaceutical sector, with 647 billions and 3530 operations (record for the operation), become leader and first contributor of M&A activity; it's interesting the acquisition by Actavis Plc of Allergan Inc. for 68,4 billions of dollars, and also the fusion between HJ Heinz Co and Kraft Food Group Inc. (for a final value of 46,1 billions).

The Information, Communications & Entertainment market is the second for the importance with 419 billions of value (compared to the 396 billions of 2014), and 3361 operations made (+3% compared to 2014). The most important deal is the acquisition of DirectTV Inc. by AT&T Inc. for 48,1 billions of dollars.

The industrial markets is the third sector with 256 billions of value (+58% compared to the 2014) and a contribution of 13% to the M&A market.

The Energy & Utilities lost the 22% of value (248 billions), and the 23% of transactions (806 transactions) compared to the 2014.

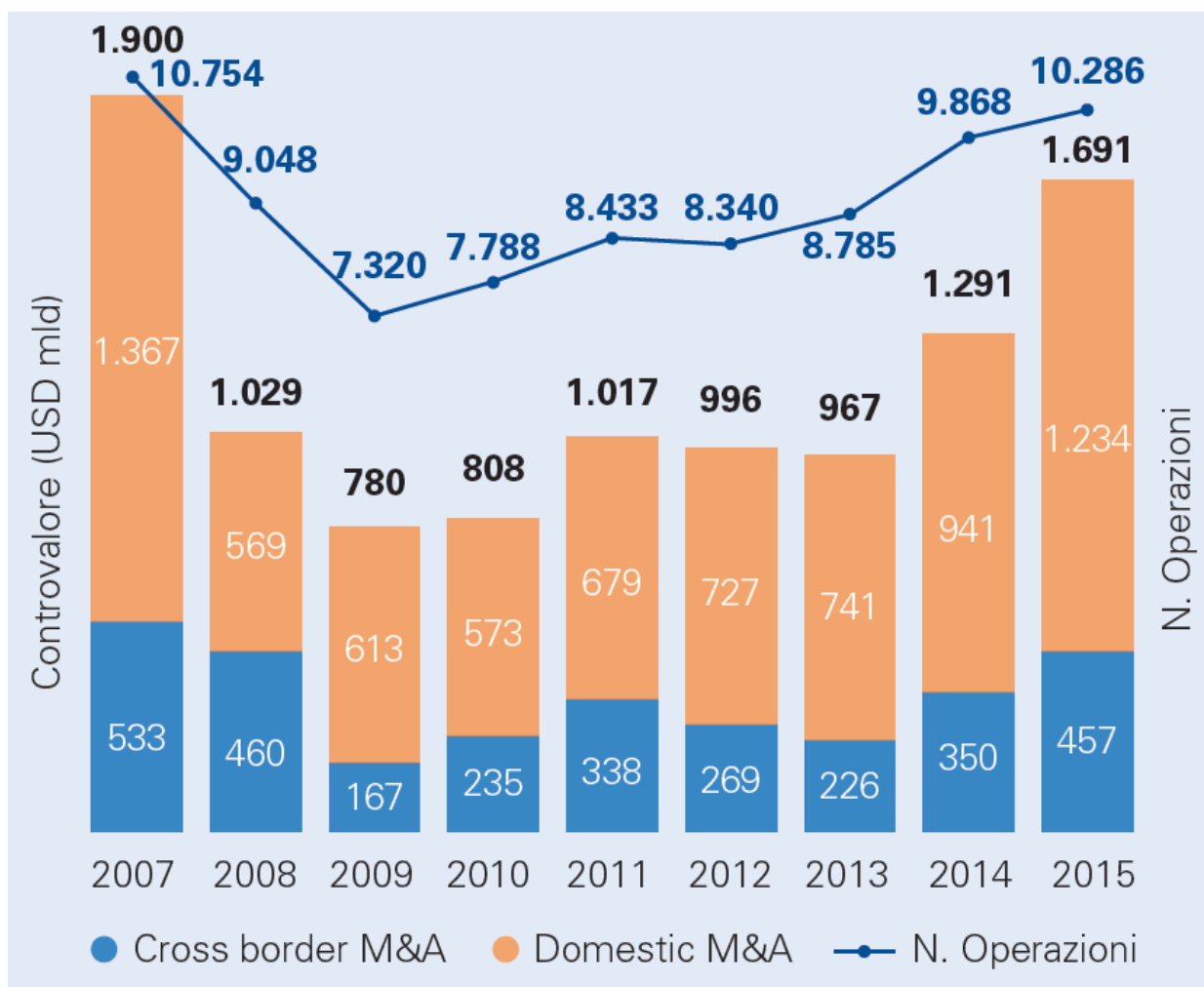
¹⁰⁸ Ibidem

The contribution of Support Services & Infrastructure Market and Financial Services market to the M&A market is the same of 2014 even if the growth of 30% for both (in transactions and values).

Graph 47: Top operations in USA, 2015 (Source Kpmg report, 2015)

Target	Nazione Target	Bidder	Nazione Bidder	Quota	Valore USD mld
Allergan Inc	USA	Actavis PLC	Irlanda/USA	100,0%	68,4
DirectTV Inc	USA	AT&T Inc	USA	100,0%	48,1
Kraft Foods Group Inc	USA	HJ Heinz Co	USA	100,0%	46,1
Covidien PLC	Irlanda	Medtronic Inc	USA	100,0%	42,7
Lorillard Inc	USA	Reynolds American Inc	USA	100,0%	25,1

Graph 48: M&A market transactions and values, USA 2007-2015 (Source Kpmg report, 2015)



As it's possible to see from the graph 48, the M&A market rose sharply in 2014 and 2015, with numbers near to the record of 2000 and 2007.

The big firms carry on with their process of consolidation, in order to acquire more market's quotes and as R&D (if thinking about the Pharmaceutical sector).

For purpose of the paper it's not relevant the analysis of the M&A activity from 2016 to 2018; even if it's possible to see in the graph 20-21-22 how the market change in the last year, with a raise in the number of transaction (related to the consolidation strategy of big firms) even if there was a decrease in the total value.

2.2 Capital Expenditures

Capital Expenditures are all the costs connected with a purchase, improvement or maintenance operations, made by the company on long assets to improve their efficiency or capacity¹⁰⁹. Those assets are usually, as plants property or equipment (Fixed assets or Non-consumable ones), long-term assets with a high duration. The capital expenditures (from now on CapEx) are considered all the costs connected to the asset's purchase, fixed (like machineries, buildings, software, land, plant etc...) and intangibles ones (like patents or licenses).

The CapEx costs are inside the cash flow statement, due to the outgoing of cash from the company; this caused a change in short term and long-term company's liquidity availability, this kind of investment's decision must take into account the company's financial health in a short and long term view. Normally the CapEx costs are maintained equal each year by the managers, this for showing the ongoing investing activity to the investors.

The Capital Expenditures decisions are fundamentally for the firm (because of the decision nature), this for four main reasons¹¹⁰:

1. High initial costs: in many industry, as manufacturing utilities or production, the costs for investing are very high; despite the long-term benefit at the beginning there is a big outflow of cash due to the expensive investments needed.
2. Depreciation: if there is a purchase of an asset, and so an increase in the asset accounts of the company, this must be depreciated over the successively useful periods of its.
3. Irreversibility: when there is the decision of buying an asset, as a machinery or a plant, it's very hard to "take back" the investment, due to the high specific degree of it; the firm must be sure when take such decisions.

¹⁰⁹ <https://corporatefinanceinstitute.com/resources/knowledge/accounting/capital-expenditures/> , Corporate Finance Institute

¹¹⁰ Ibidem

4. Long-term effects: the investment in CapEx are usually with a long-term view, it's very rare to see the effect of it immediately; the manager, in taking investment decisions, has to be sure of the company long-term strategy and goals.

Now let's going to analyse the difficulties related to CapEx and so the challenges faced by the managers¹¹¹:

- Measurement problems: it's very complicated to identify calculating and estimating the investment's cost, more if the investment is in a long-term view (many factors expected at the beginning could change over time).
- Unpredictability: no one knows the future and so it's very hard to predict all the possible risk or the possible factors connected with the investment decision.
- Temporal Spread: the problem there, is the difficulty in estimate the discount rate and the establishment of equivalence related to the costs and the benefit of the long-term investment project.

The CapEx are a fundamental decision for the firm's managers, considering the impact of them on the strategy and on the balance sheet/cash flow of the firm. The wrong decisions could have a disaster effect on the financial health of the firm, as a positive effect too on the opposite.

In the last chapter we are going to analyse in numerical terms the CapEx of the firm before the crisis and post crisis, to see if there was a shift between those kind of investments (internal ones), external investments (M&A) and shares buyback.

¹¹¹ <https://corporatefinanceinstitute.com/resources/knowledge/accounting/capital-expenditures/> , Corporate Finance Institute

2.3 Shares Buyback

The shares buyback is an operation in which the company buy the own shares; the used operations are or the tender offer or the purchase of shares from the market (with open market operations). The shares acquired will be or cancelled or they will be added to the financial activities in the balance sheet of the firm (there are limits on shares repurchase, made by the central bank).

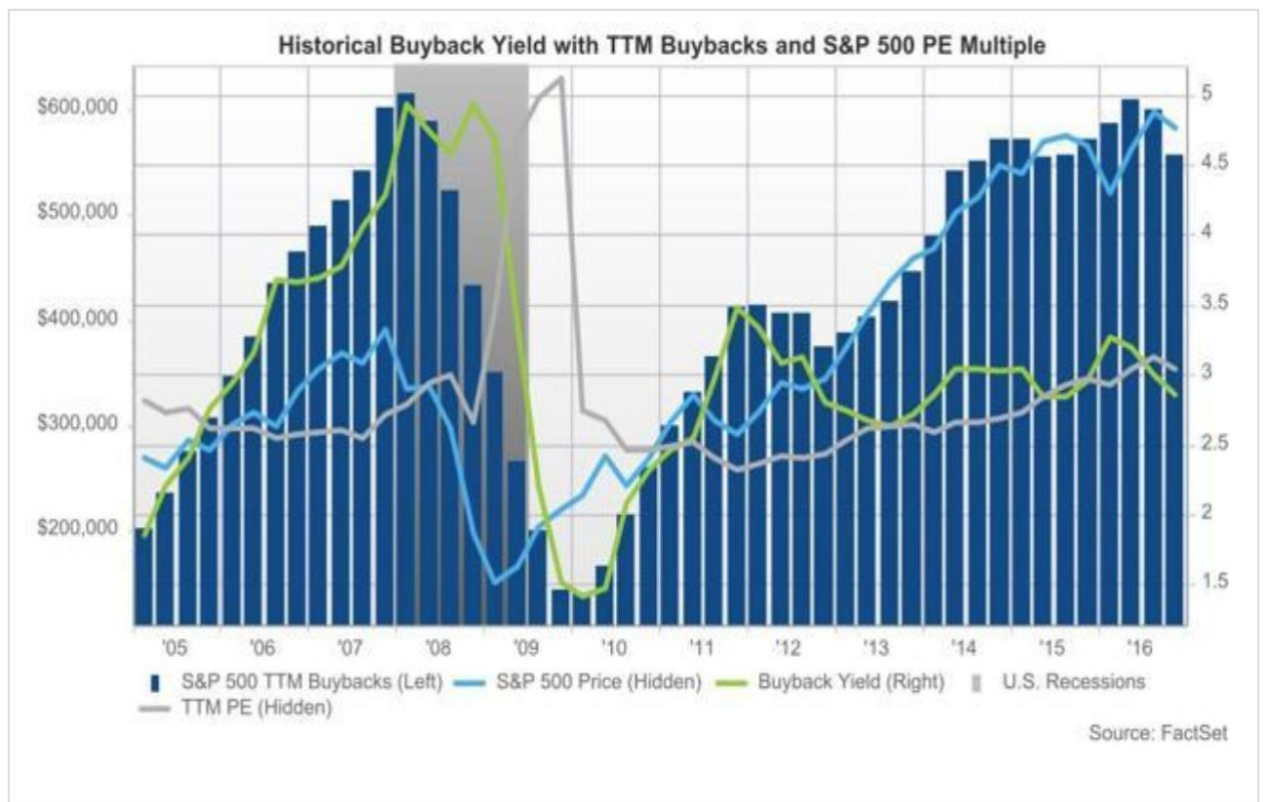
There are many reason for shares buyback, the most important are:

- Remunerate investors: at the beginning of firm life cycle there is an equity fund raising, the money is raised among investors, which demand after many years a remuneration in equity value or cash (in case of big investors) through dividends or shares buyback (the payment of dividends is a cost of equity for the firms); through the shares buyback the firm could remunerate investors and reduce the overall cost of capital.
- Undervaluation of the stock: this occur form many reason as the inability of the investors to see the potential of the firm or for the general bearish sentiment of the market; for example between 2010-2011 the US firms started a program of buybacks due to the low price of relative stocks after the financial crisis of 2008 (they believe in their potentiality). The company in this case buy the shares at a determined price in order to sell them when the market has corrected, this will lead an outflow of cash in the short term without knowing if this tactics will be effective or not in the future (it's very risky).
- Key financial ratios: this occurs when the firm wants to improve or fix its financial ratios; those are the EPS (earnings per share, ratio for medium-long term investors), this increase in case of shares repurchase, the P/E (price/earnings) and ROE (return on equity), they increase as the EPS (those ratios are seen mainly by short-medium term investors).

- Ownership Consolidation: with the repurchase of shares, the company is able to reinforce the ownership, this will translate in a stronger management (with lower disputes among the stockholders).

The shares buyback will translate in the market with an increase of the investor's wealth (wealth effect, already seen in the first chapter).

Graph 49: Buybacks from 2005 to 2016, historical yield, TTM buybacks and S&P 500 multiple (Source SeekingAlpha, 2018).



As is possible to see from the graph 49, from the start of quantitative easing (and so the huge injection of liquidity) after the recession period in US due to the financial crisis, the buybacks trend rise sharply each year; the S&P 500 also rise sharply as the buybacks trend.

Chapter 3: Quantitative Analysis of M&A, Capex and Buybacks

In this chapter, there will be:

- First part: the analysis, with graphical tools, of Dow Jones Index trend (related to the Industrial Sectors), of S&P 500 Index trend and of macroeconomic US trend with the Gross Domestic Product analysis (the analysis will be done in a range of 12 years from 2003 to 2015 and for the time periods 2003-2006 & 2012-2015).
- Second part: there is, the description of the sectors analysed for the paper's purpose, and the S&P500 Index trend of each specific sector analysed.
- Third part: there will be the analysis of 34 firms related to the industrial sector (S&P 500 Industrials, \$SRIN), of 13 firms related to the communication services sector (S&P 500 Communication Services, \$SRTS) and of 19 firms related to the information technology sector (S&P 500 Information Technology, \$SRIT). The analysis will be done on the Investment (Intern=Capex, Extern=Acquisition, Buybacks) made by the firms before the crisis, 2003-2006, and after the crisis, 2012-2015).
- Fourth part: a brief comment to explain better what was found after the numerical analysis in relation of all the paper (so in relation with the Quantitative Easing and the cost of debt).

After the last part, it will be possible to have a clearer vision of how the firm's investment change over time, within the middle one of the worst financial crisis of all time.

3.1 The macroeconomic & Index analysis

Graph 50: Dow Jones Index 2003-2015 (Source, <https://it.tradingview.com/symbols/DJ-DJI/>)

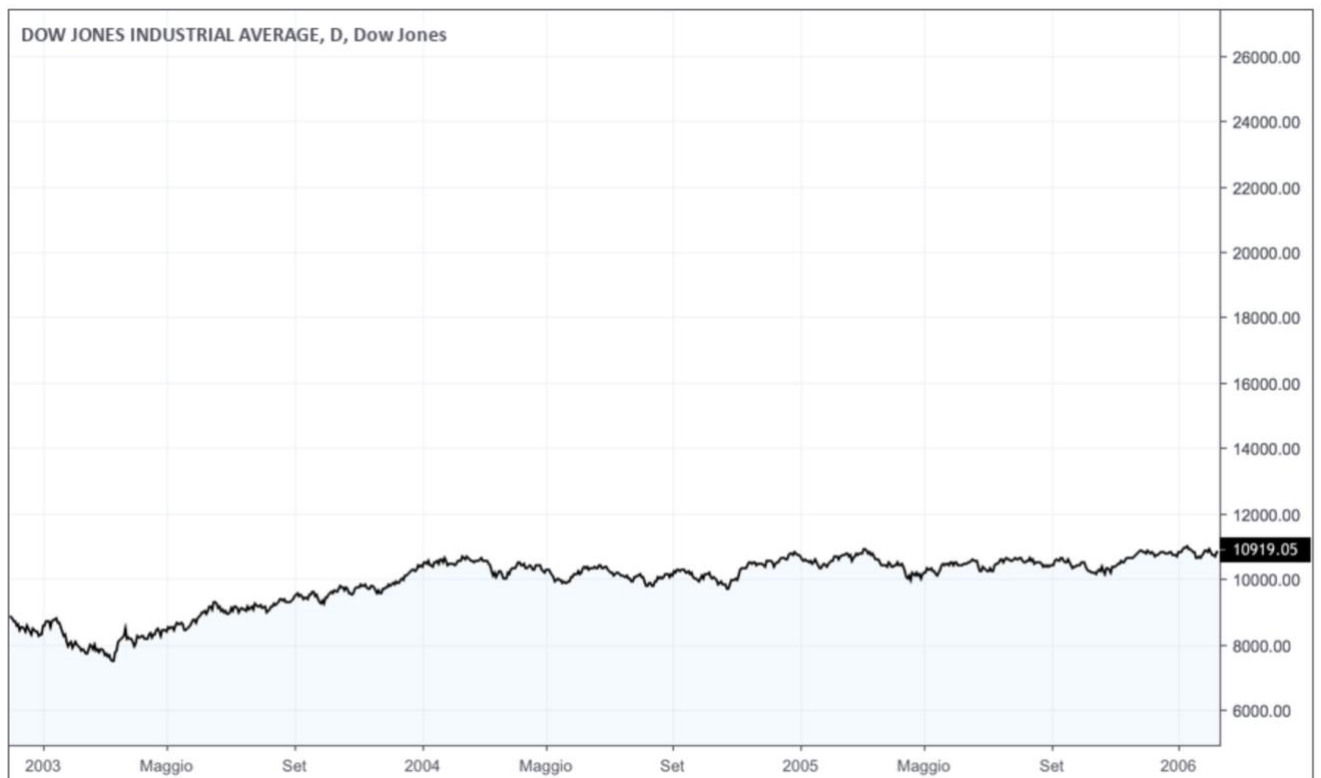


How it's possible to see from the graph X the trend was always positive, except from the 2007 to 2009 during the financial crisis which caused the market collapse. Now let's going to see more in details the periods from 2003 to 2006 and from 2012 to 2015.

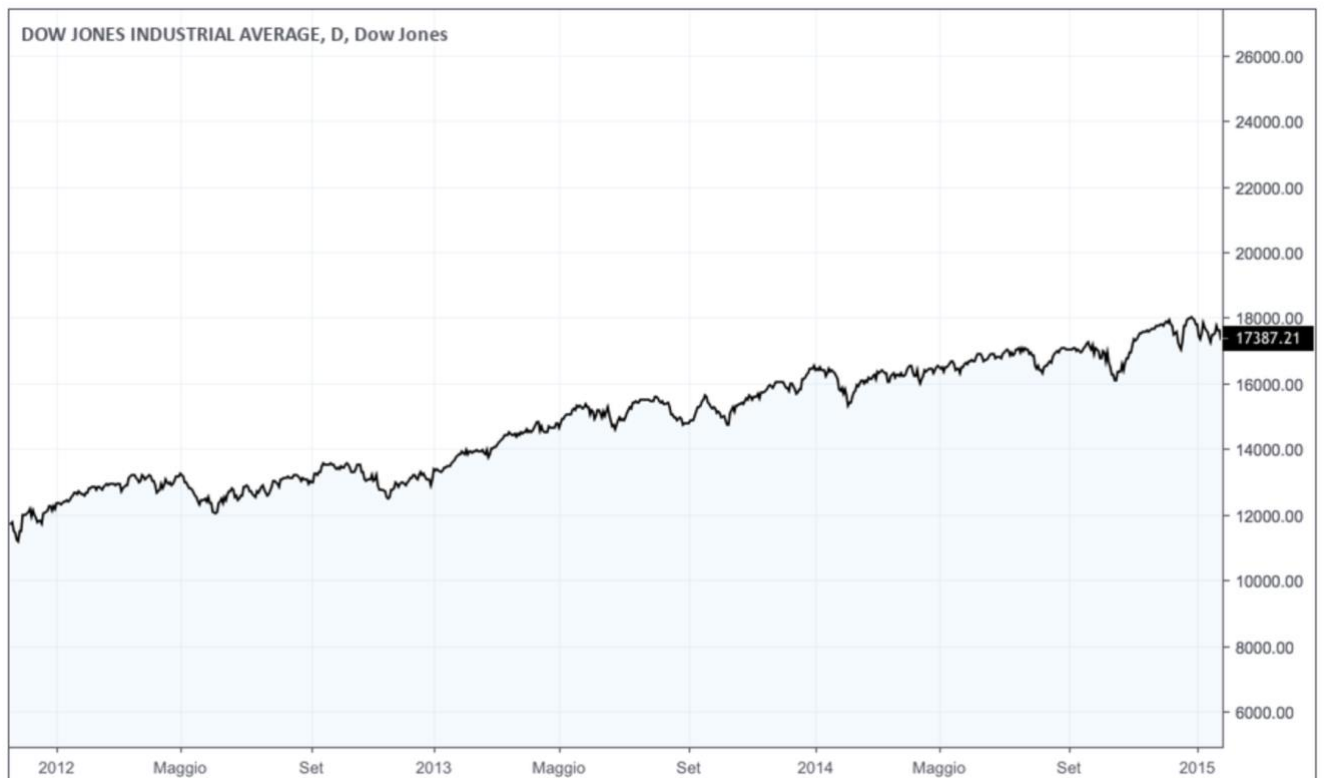
Graph 51: Annual Growth Dow Jones, pre-crisis and post-crisis (Source, it-investing.com)

Pre-Crisis Period	Growth %	Post-Crisis Period	Growth %
2003-2004	23,40%	2012-2013	7,47%
2004-2005	3,34%	2013-2014	24,14%
2005-2006	-0,28%	2014-2015	7,60%
2006-2007	15,28%	2015-2016	-1,39%

Graph 52: Dow Jones Index 2003-2006 (Source, <https://it.tradingview.com/symbols/DJ-DJI/>)



Graph 53: Dow Jones Index 2012-2015 (Source, <https://it.tradingview.com/symbols/DJ-DJI/>)



How it's possible from the last graph, due to the Financial Crisis and the relative market fall, the Dow Jones Index growth more from 2003 to 2006 compare to the 2012- 2015 period. If look to the graph X the growth for the period 2003-2006 is equal to +41,74%, while from 2012 to 2015 is equal to 37,82%!

This shows the effects of the crisis on the market before and after; anyway, must be said that the Dow Jones after 2015 as reach new high records due to the financial recovery of the next years with the peak of 26000 in 2018, compare to the peak of 1400 in 2007! (however it's not the paper's purpose to analyse that period).

Graph 54: S&P 500 Index 2003-2015 (Source, <https://it.tradingview.com/symbols/SPX/>)



The trend of S&P 500 Index is very similar to Dow Jones one; however, the recovery phase period from 2012 to 2015 (+63,34%) was stronger compared to the pre-crisis period from 2003 to 2006 (+60,26%), it's possible to see it in the next graph bellows. As for the Dow the Index reach new high records on 2018, with a peak near to 3000!

Graph 55: S&P 500 Index 2003-2006 (Source, <https://it.tradingview.com/symbols/SPX/>)



Graph 56: S&P 500 Index 2012-2015 (Source, <https://it.tradingview.com/symbols/SPX/>)



Graph 57: Annual Growth S&P 500, pre-crisis and post-crisis (Source, it-investing.com)

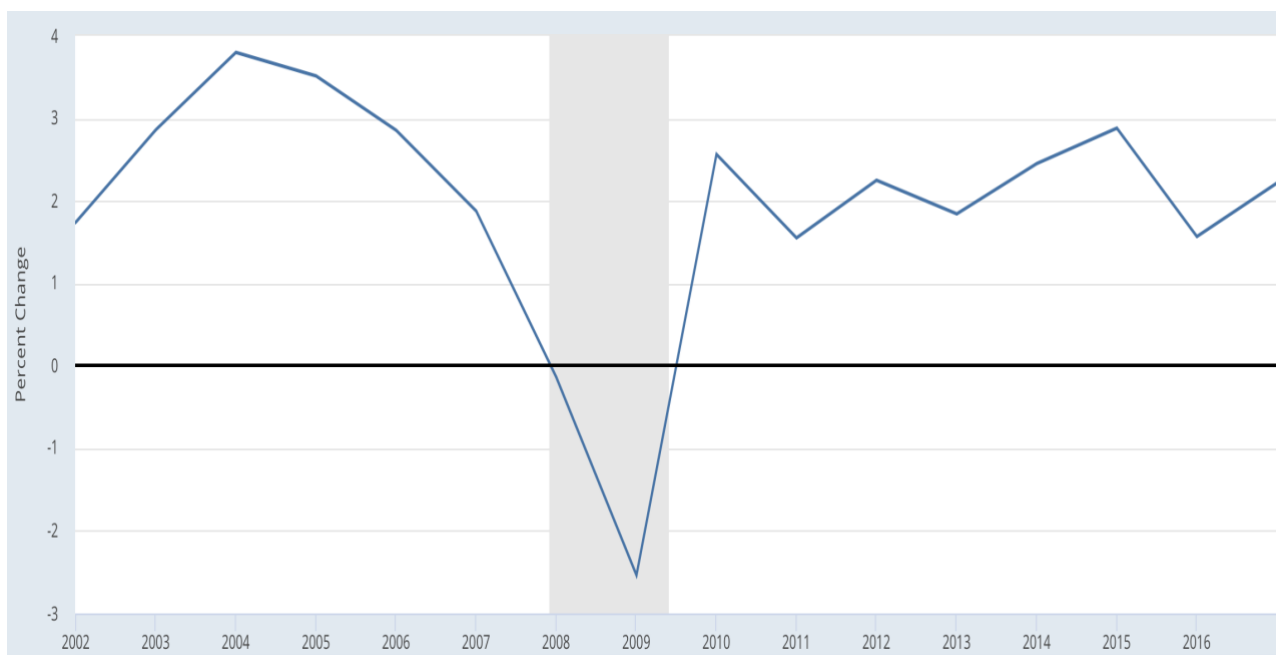
Pre-Crisis Period	Growth %	Post-Crisis Period	Growth %
2003-2004	28,68%	2012-2013	16,00%
2004-2005	10,88%	2013-2014	32,39%
2005-2006	4,91%	2014-2015	13,69%
2006-2007	15,79%	2015-2016	1,38%

The US gross domestic product growth in pre-crisis and post-crisis, with the exception during the period from 2007 to 2009. Despite the growth, the financial crisis affects the recovery phase; in fact during 2003-2006 the GDP growth by 12,03%, while during 2012-2015 growth by only 8,73! (it's possible to see what said before in the graphs below)

Graph 58: Annual Growth GDP US, pre-crisis and post-crisis (Source, it-investing.com)

Pre-Crisis Period	Growth %	Post-Crisis Period	Growth %
2003-2004	3,80%	2012-2013	1,84%
2004-2005	3,51%	2013-2014	2,45%
2005-2006	2,85%	2014-2015	2,88%
2006-2007	1,87%	2015-2016	1,56%

Graph 59: USA GDP trend from 2003-2015, (Source, <https://fred.stlouisfed.org/series/GDPC1>)



3.2 Sectors Description and Relative Index Analysis

Let's going to look more in detail the S&P 500 sectors; there are 11 main sectors:

- **Communications Services:** firms of that sector provide entertainment or facilitate communication through many kind of media (Television, Radio...) or tools (Internet). Firms in this sector are sensitive to economic cycle, and the firms related to internet communication have a higher growth profiles (Ex. Netflix). The investors are likely to invest in such firms due to the increase (in the last years) of broadband and faster internet demand.
- **Consumer Discretionary:** a sector in which firms provide goods or services useful but not essential (like cars or luxury in general for example). The performance of those companies is related to the overall economy of people, so in case of a recovery phase with low cost of debt this sector will have a good performance. Potential of high margin in case for example of luxury market.

- Consumer Staples: companies provide goods or services essential, as food and beverage or clothing. This segment of industries is more stable if there is any change in the economy, this due to the good's essentiality; the sector offer a good potential in case of entrance in emerging markets with a high population (like China, India or Brazil).
- Energy: firms involved in the resource, production or management of energy sources, like oil or gas. The performance of those firms is related to the price commodity on the financial market and is sensitive to the overall economy and to the demand. The potential of those companies is in the innovations of "green" energy sources.
- Financials: companies engaged in the banking, brokerage or insurance business. Sensitive to changes in the worldwide economy and to over-perform at the beginning of the business cycle (recovery phase).
- Health Care: firms involved in the production of sanitary good or services and of medicines. The demand is stable with over-performing at the end of business cycle. The potential is the innovation and the discoveries of new treatments or medicine.
- Industrials: firms involved in production of goods and services which support other sector as defense, aerospace, engineering etc... . Sensitive to business cycle and over-perform in the beginning of it. Potential for the relation with high tech sector (with a strong potential) as defense or aerospace, and with the infrastructure one.
- Information Technology: companies which provide software, hardware, semiconductors or consulting services. Sector with a high volatility but at the same time with an high potential due to the growth of cloud/mobile computing or big data. Sectors characterized by large capitalizations and high previsions on company's potential growth.
- Materials: firms related to the production of chemicals or plastic products, and to the extraction of minerals or metals. Over-performing in the last part of the cycle, sensitive to this latter and to the commodities prices of metals and minerals. In case of entrance in emerging markets it's likely a good return on the investment.

- Real Estate: firms with a large portfolio of commercial real estate properties. Sector sensitive to the market cycle, but useful in hedging or in a diversification strategy.
- Utilities: companies which provide the service of electric power, water or natural gas to the final consumer. Sector very stable, related to the stable demand of those services; it could be a defensive investment in case of troubles on financial market, due to the high dividend yields despite a low expected growth.

The analysis, for the paper's purpose, takes into consideration three out of eleven sectors: the Communication Services sector, the Industrial one and last the Information Technology sector.

Before starting with the trend of those sector over the time (pre-crisis period, post-crisis and overall one), it's important to say the motivation of why those sectors and no other ones.

The Industrial sector is selected due to its tradition and because it relies on the capital (Capital Intensive) translates, most of the time, in Capital Expenditures; another reason is the constant growth of the industrial firms after a recession.

The Information Technology sector is selected due to the big usage of M&A for the company's growth (External Investment) and for the Digital relevance nowadays. If the Industrial was taking for the tradition, the Information Technology one was taking for being "new".

The last sector, Communication Services, is a classic business taken into consideration for the high level of Infrastructure investments (they could be both types, external and intern investments).

Other motivations, behind the choice of those sectors is the will to take two opposite sector, if we consider the communication services (and its strong relationship to internet nowadays) and the information technology as one sector (this due to the strong connection behind them), and see how the investment of those changes over time (in relation of course with the debt and its lower cost after Quantitative Easing).

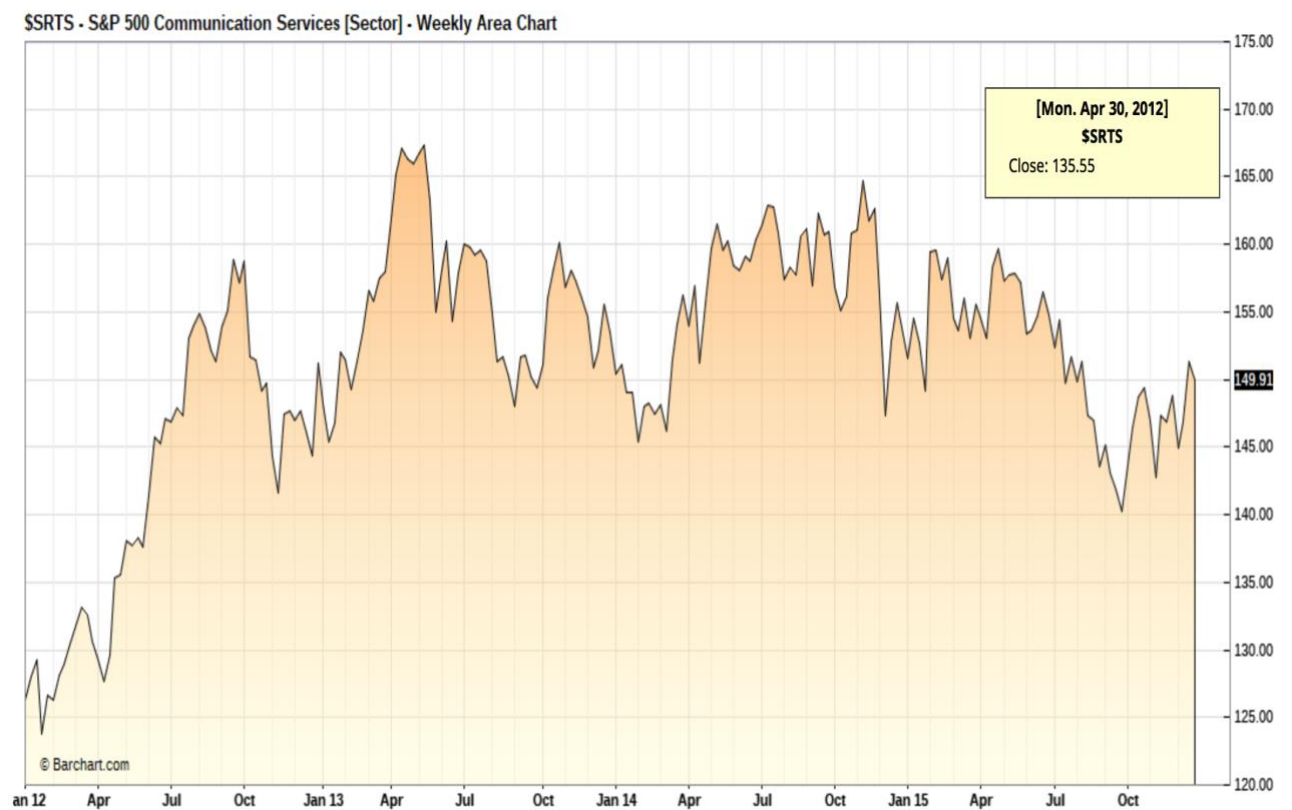
The main difference, between the sectors selected, is the kind and size of assets; the industrial is characterized by a large number of physical/tangible assets (with all the financial consequences of the case) used for the main purpose of production for those companies, while the information technology and the communication services have more intangible assets compare to the other sector to provide services (and for the production!).

Now let's going to look quickly the trend of those three sector by analysing the relative index.

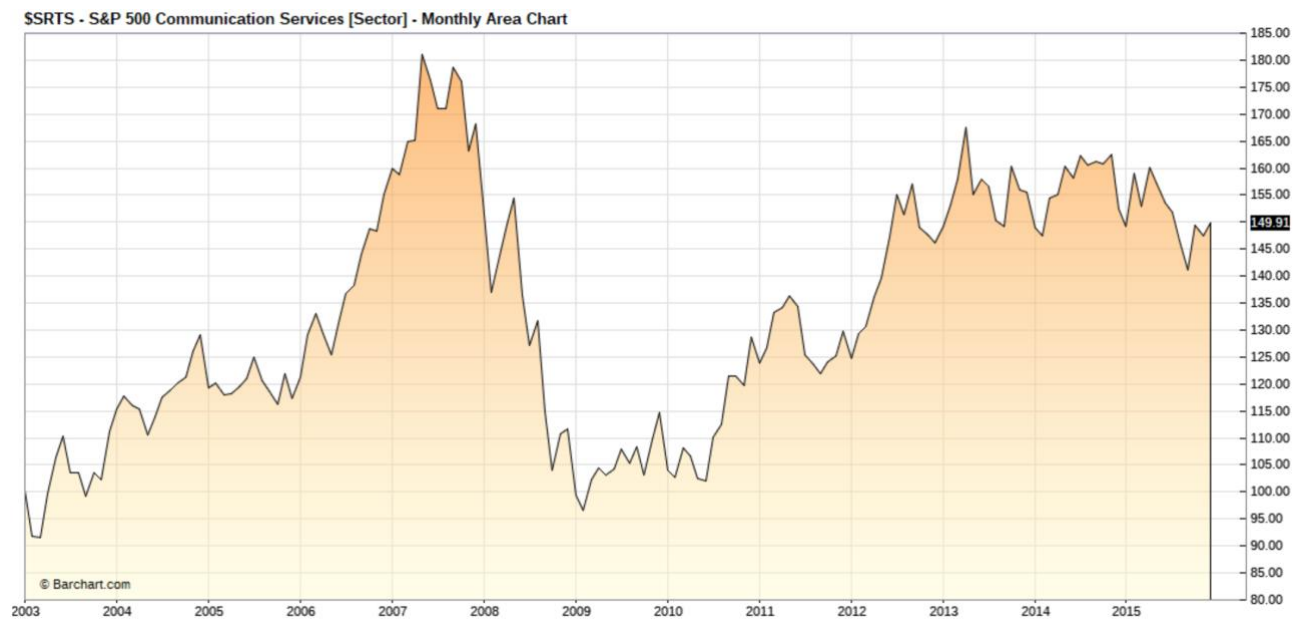
Graph 60: Trend Communication Services Index \$SRTS, 2003-2006 (Source, it.tradingview.com)



Graph 61: Trend Communication Services Index \$SRTS, 2012-2015 (Source, it.tradingview.com)



Graph 62: Trend Communication Services Index \$SRTS, 2003-2015 (Source, it.tradingview.com)

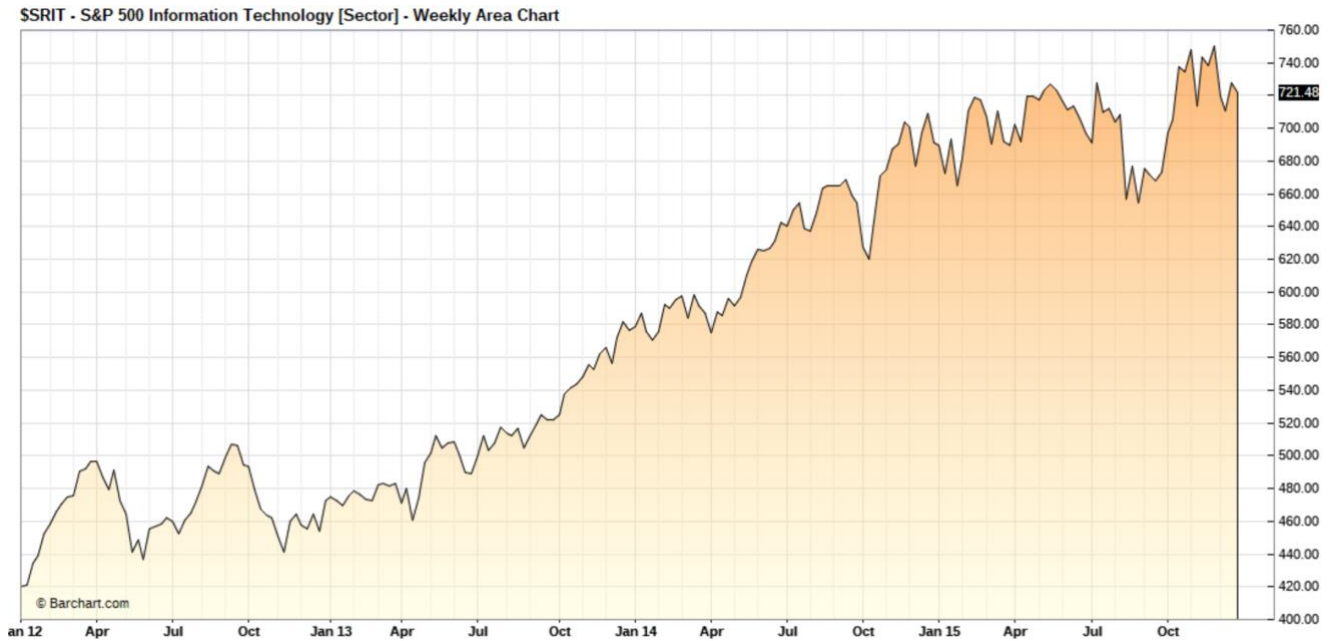


The trend is positive from 2003 to 2006, with a sharply rise, while from 2012 to 2015 there is a growth but the trend is positive at the beginning, but after 2012 the trend become fickle. If take a look to the last graph the trend is positive, unless during the crisis (2007-2009), but the sector didn't reach the peak of 2007.

Graph 63: Trend Information Technology Index \$SRIT, 2003-2006 (Source, it.tradingview.com)



Graph 64: Trend Information Technology Index \$SRIT, 2012-2015 (Source, it.tradingview.com)

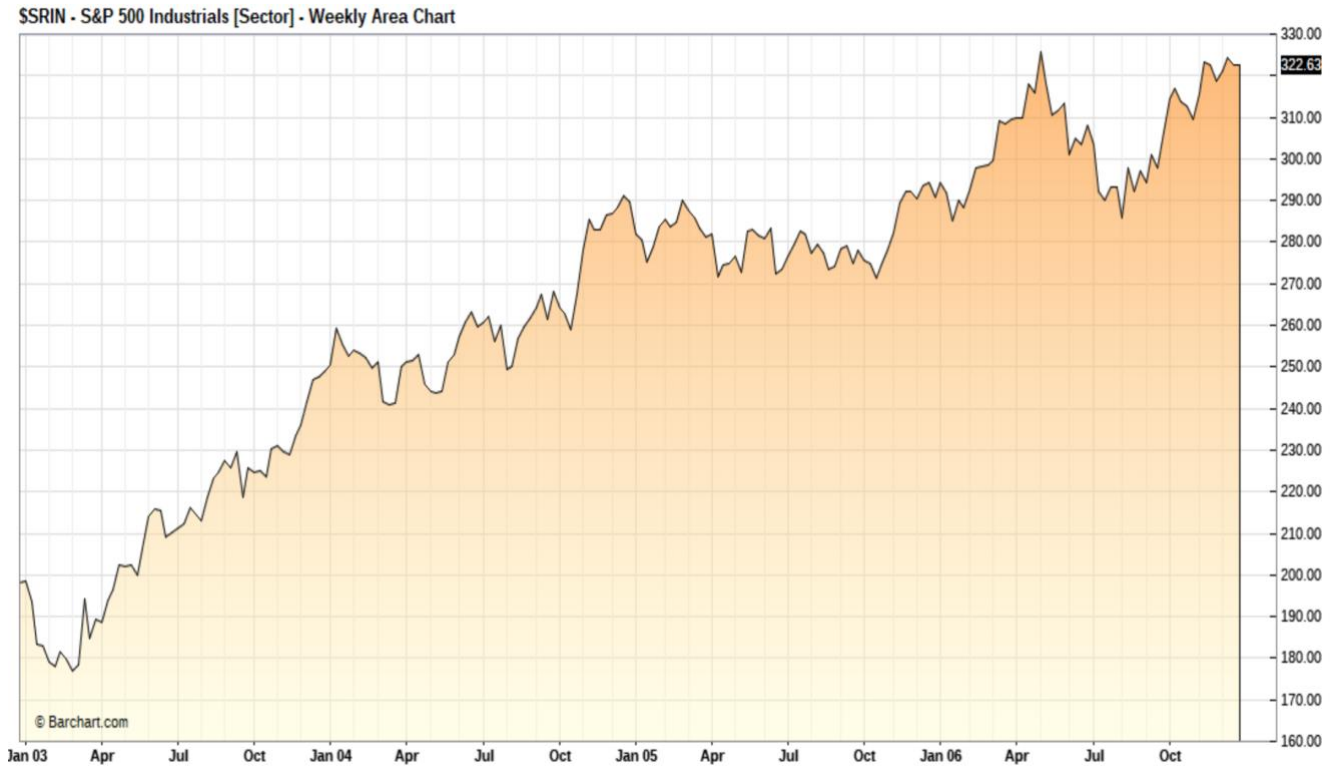


Graph 65: Trend Information Technology Index \$SRIT, 2003-2015 (Source, it.tradingview.com)

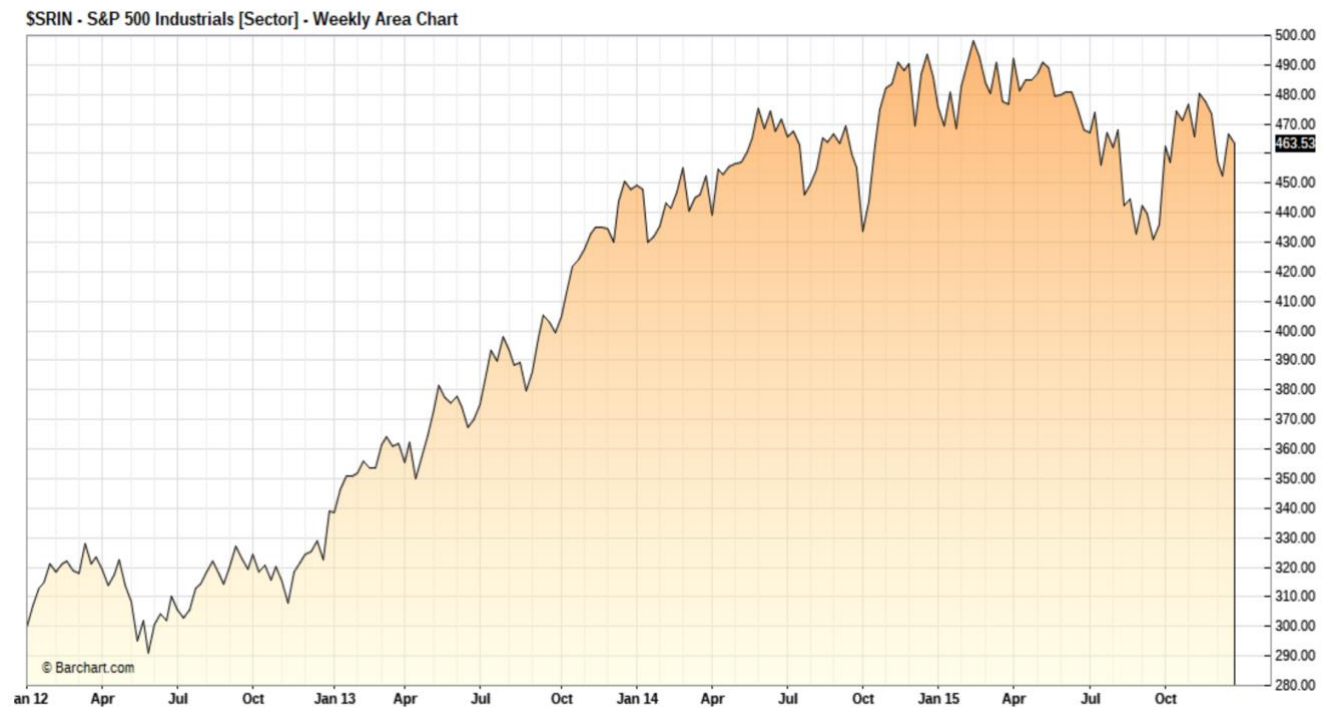


The Information Technology Index increased during 2003 and became picky from 2004 to 2006; while from 2012 to 2015 the Index rose sharply and reach a new peak compared to the pre-crisis period (peak of 2007). The overall trend, from 2003 to 2015, is positive despite the decrease during the crisis.

Graph 66: Trend Industrial Index \$SRIN, 2003-2006 (Source, it.tradingview.com)



Graph 67: Trend Industrial Index \$SRIN, 2012-2015 (Source, it.tradingview.com)



Graph 68: Trend Industrial Index \$SRIN, 2003-2015 (Source, it.tradingview.com)



The trend is positive in pre-crisis and post-crisis period with a sharply rise; the Index reach a new peak in 2015 compared to the 2007 peak. As the other Index, there is the decrease of it during the financial crisis.

3.3 Numerical Analysis of Firm's Investments

In this part, there will be the deep analysis inside the firm's number, to understand how the investments change in relation to the lower cost of debt due to the Quantitative Easing.

The firms take into consideration are 34 of Industrial Sector, 13 of Communication Services Sector and 19 of Information Technology Sector (it's already explained before the decision to take those sectors); the firms are selected in relation to:

- Capitalization: it is over 10 billions of dollars for all of them, some of the companies selected have capitalizations over 50 billions (for example Apple).
- Information Issue: not all the firms have available data for the period 2003-2006 (because not already quoted or not already borne!).
- Revenues: they are over 5 billions of dollars, this for excluding or the newest firms or the not important ones for paper's purpose.

With a basket of 66 companies it's possible to analyse how the investments due to the Quantitative Easing and all its consequences change over time, more in specific before the crisis 2003-2006 and after the crisis 2012-2015. However, must be said that the analysis is conducted in the broad strokes without the usage of a regression analysis for calculating the incidence of all the variables related to the firms to the firm's variables needed.

The analysis will start from the focus on the Communication Services sector, then on the Information Technology and the Industrial sectors, and final there will be the analysis of the results (all the table with the firms and all the relative data will be in the last part of the chapter).

The first data analysed are the average of D/E (calculated as the ratio between the Total Debts and the Total Capital) from 2003 to 2006 and from 2012 to 2015; this for evidencing if the firms have more debt in the post-crisis period compare to the pre-crisis one.

Then there is the analysis of the Capital Expenditures, calculated as the sum for the periods selected for the research; same speech for the Buybacks, the relative data were found on Bloomberg on the section Cash Flow Statement of each firms for each year analysed, under the heading "repurchase of own stocks".

For the analysis of the M&A, the firm's data relative to the acquisitions are taken by Zephyr (Bureau Van Dijk) and added up for the paper's purpose.

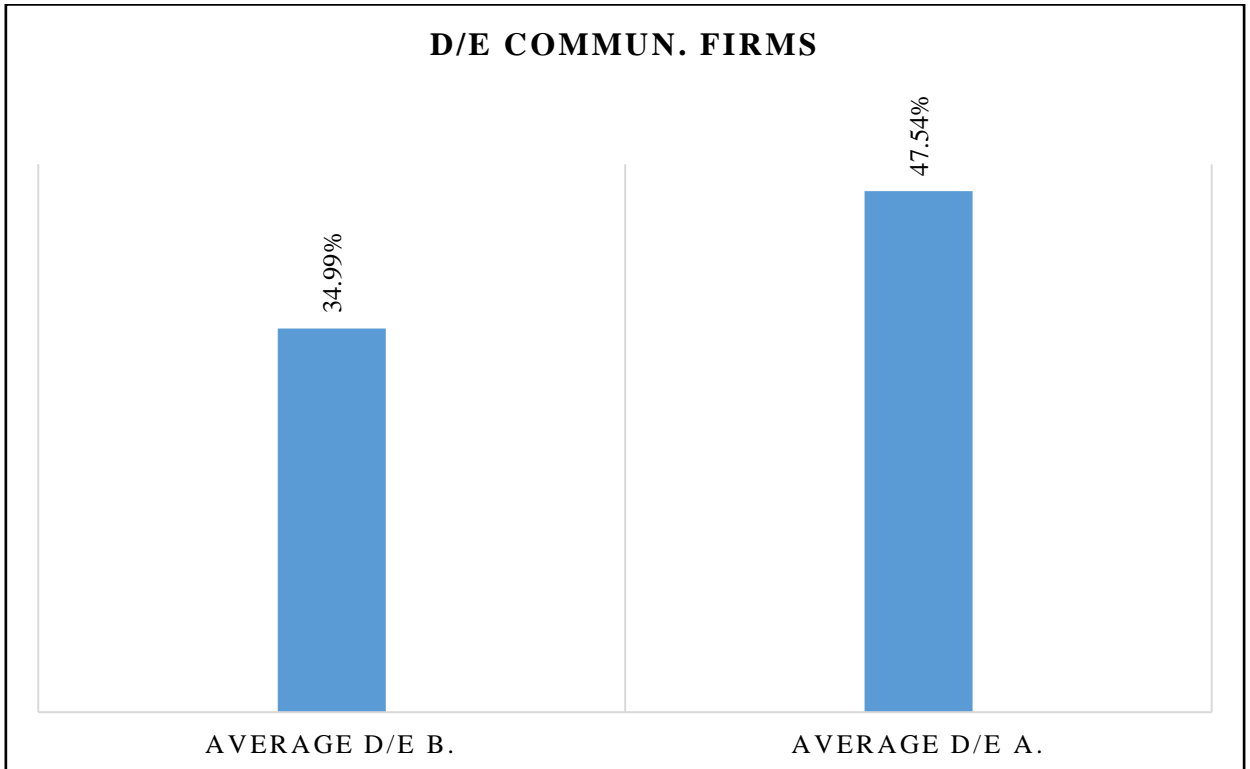
In the review of each sector there will be the firm's D/E data and two graphs: one for the D/E and the other for the Capex/Buybacks/Acquisitions analysis and a little ending comment.

3.3.1 Communication Services Firms Analysis

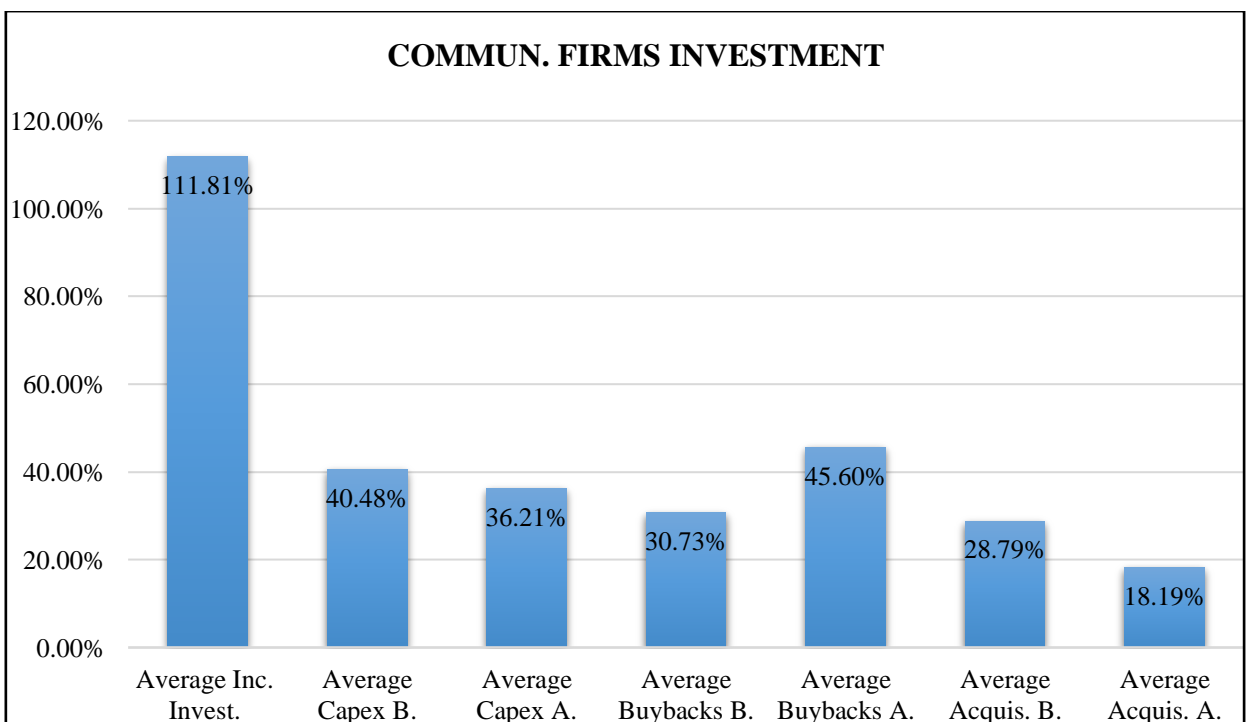
Table 7: Firms Communication Services and D/E, 2003-2006 & 2012-2015 (Source, Bloomberg)

FIRM COMMUNICATION SERVICES	SYMBOL	D/E before	D/E after
		2003-2006	2012-2015
CBS	CBS	20,71%	46,68%
Comcast	CMCSA	56,50%	45,38%
CenturyLink	CTL	45,40%	55,82%
Walt Disney	DIS	32,14%	24,50%
Discovery A	DISCA	0,00%	51,74%
DISH Network	DISH	124,78%	90,51%
Electronic Arts	EA	0,00%	18,35%
Fox Inc	FOX	27,02%	44,75%
Alphabet A	GOOGL	0,00%	5,45%
Omnicom	OMC	39,64%	54,45%
AT&T	T	35,25%	46,50%
Viacom B	VIAB	35,60%	68,22%
Verizon	VZ	37,80%	65,64%

Graph 69: Average D/E Firms Communication Services,2003-2006 & 2012-2015 (Source, Bloomberg)



Graph 70: Average Capex/Buybacks/Acquisitions Firms Comm. Services,2003-2006 & 2012-2015 (Source, Bloomberg)



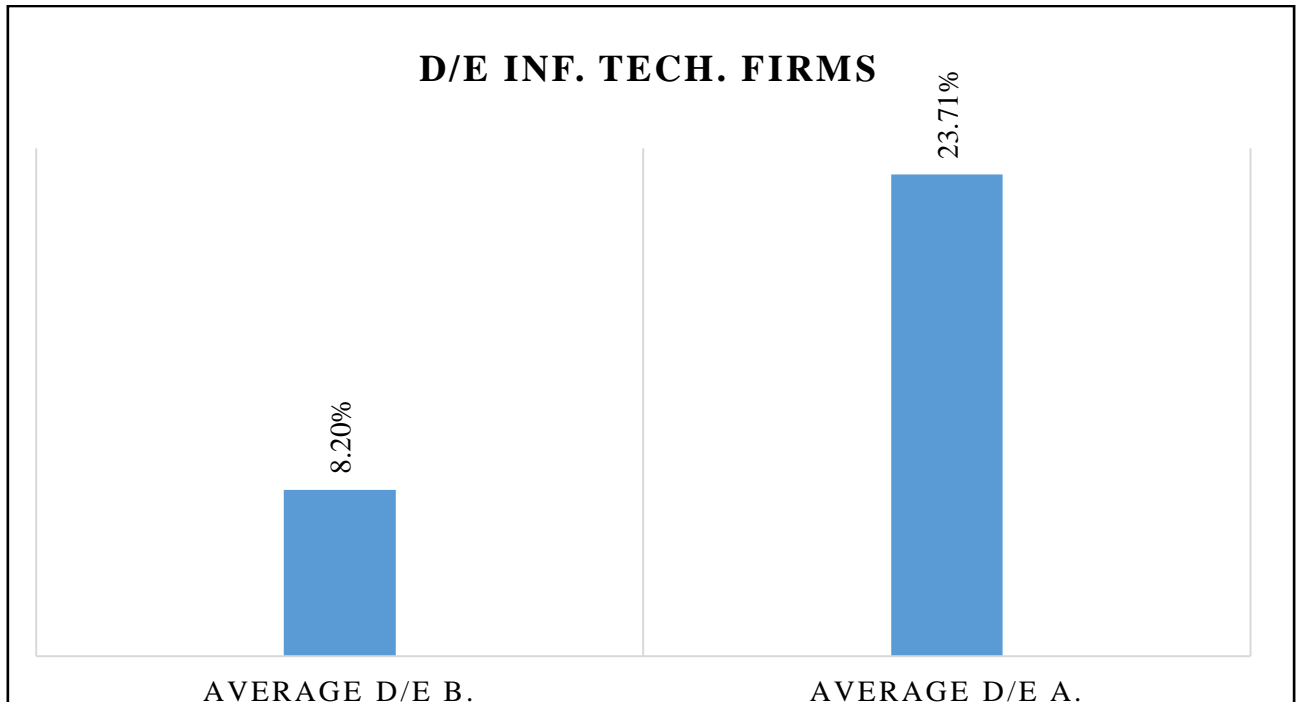
In the communication services sector as you can see in the graph X, the Total Debt of the firms in the post-crisis period, 2012-2015, has increased of 13% compared to the pre-crisis period, 2003-2006; regard the investments it's possible to see in the graph X that, despite the increase of average Inc. Investment (111,81%, this factor is the result of innumerable macroeconomic and microeconomic variables), the average of investments in Capex and in Acquisition decrease, while the average of investments on Buybacks increase more the 15% basis points.

3.3.2 Information Technology Firms Analysis

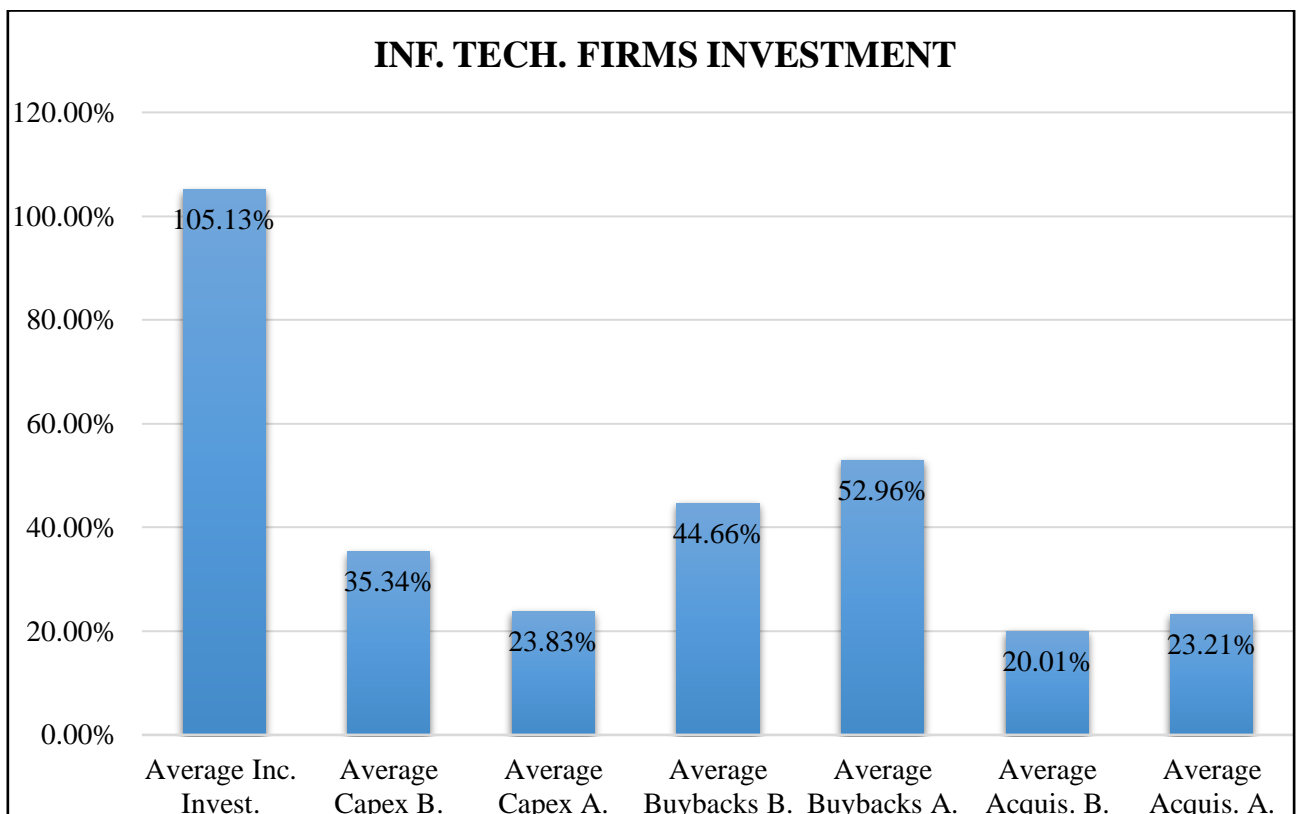
Table 8: Firms Information Technology and D/E, 2003-2006 & 2012-2015 (Source, Bloomberg)

FIRM INFORMATION TECHNOLOGY	SYMBOL	D/E before	D/E after
		2003-2006	2012-2015
Apple	AAPL	1,71%	17,86%
Accenture	ACN	2,50%	0,32%
Adobe	ADBE	0,00%	19,12%
Applied Materials	AMAT	5,35%	24,98%
Salesforce.com	CRM	3,42%	26,12%
Cisco	CSCO	5,40%	25,99%
Cognizant	CTSH	0,00%	7,40%
HP Inc.	HPQ	14,22%	41,55%
IBM	IBM	4,18%	21,50%
Intel	INTC	43,20%	65,80%
Lam Research	LRCX	13,88%	26,02%
MasterCard	MA	17,70%	13,24%
Microsoft	MSFT	0,00%	20,62%
Micron	MU	14,07%	34,26%
NVIDIA	NVDA	6,68%	12,17%
Oracle	ORCL	14,00%	34,00%
Qualcomm	QCOM	0,00%	6,52%
Texas Instruments	TXN	3,75%	31,64%
Western Digital	WDC	5,70%	21,34%

Graph 71: Average D/E Firms Information Technology, 2003-2006 & 2012-2015 (Source, Bloomberg)



Graph 72: Average Capex/Buybacks/Acquisitions Firms Information Technology ,2003-2006 & 2012-2015 (Source, Bloomberg)



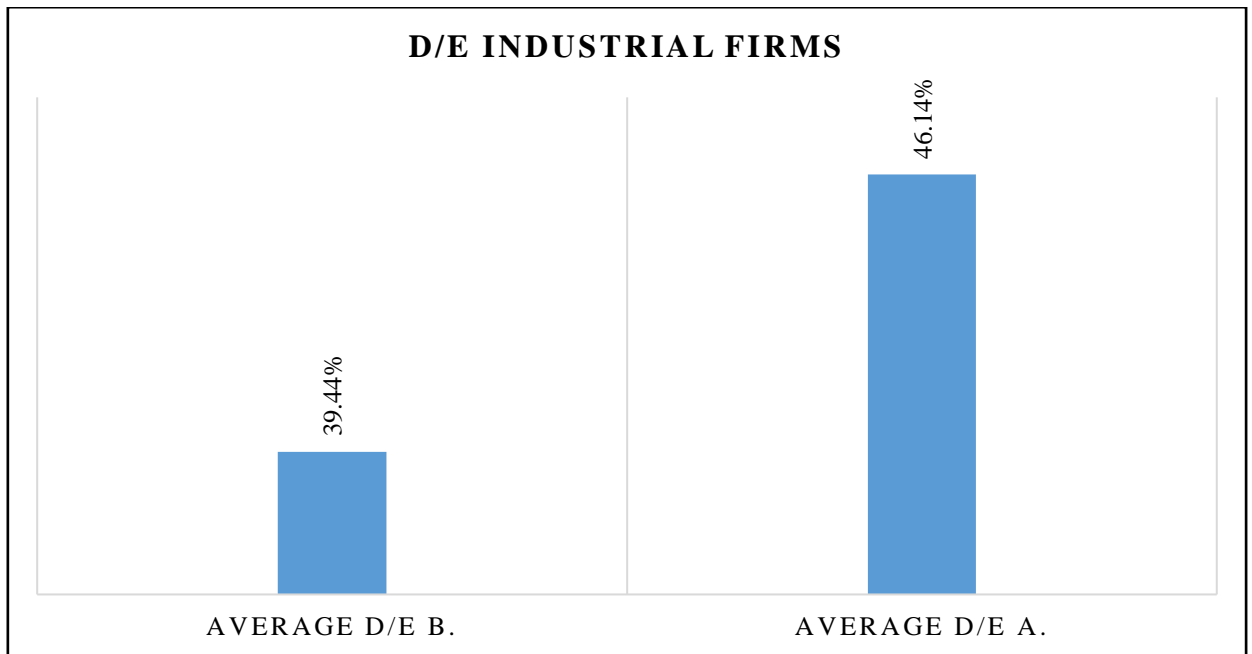
As in the communication services sector, it's possible to see in the graph X, how the Total Debt of the firms in the post-crisis period, 2012-2015, has increased of 15% compared to the pre-crisis period, 2003-2006; regard the investments in the graph X, seen the increase of Average Inc. Investment (105,13%, this factor is the result of innumerable macroeconomic and microeconomic variables), the average of investments in Capex decreases (as in the previous sector), while the average of investments on Buybacks and Acquisition increase by 8% basis points the first and by 3% the second one.

3.3.3 Industrial Firms Analysis

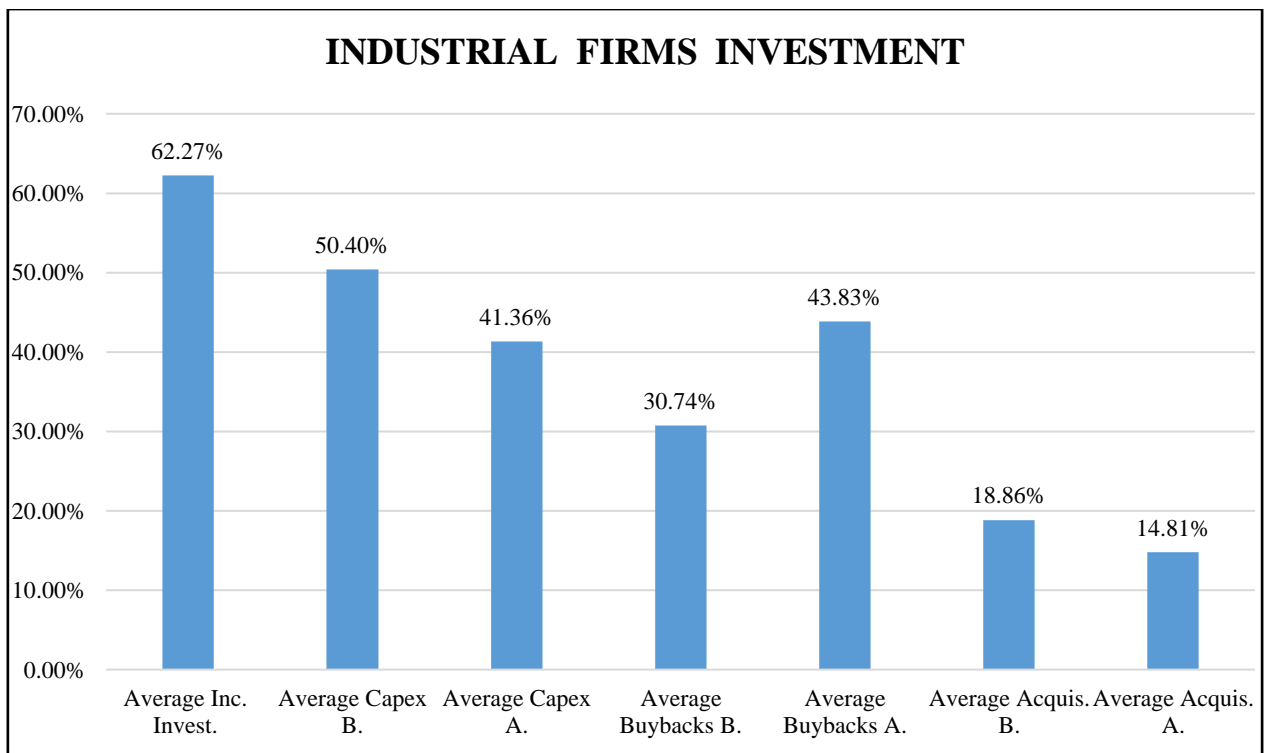
Table 9: Firms Industrial and D/E, 2003-2006 & 2012-2015 (Source, Bloomberg)

FIRMS INDUSTRIAL	SYMBOL	D/E before Crisis	D/E after Crisis
		2003-2006	2012-2015
American Airlines	AAL	104,80%	98,80%
Boeing	BA	58,00%	53,60%
Caterpillar	CAT	76,90%	68,99%
CH Robinson	CHRW	7,93%	39,80%
Cummins	CMI	41,98%	15,70%
CSX	CSX	47,02%	48,37%
Deere&Co.	DE	73,40%	81,09%
Emerson	EMR	35,43%	37,76%
Eaton	ETN	37,39%	37,42%
Fastenal	FAST	0,00%	5,33%
FedEx	FDX	23,15%	20,29%
General Dynamics	GD	30,70%	95,53%
General Electric	GE	76,83%	68,00%
WW Grainger	GWW	2,19%	22,00%
Honeywell	HON	32,70%	35,47%
Ingersoll-Rand	IR	27,90%	36,71%
Illinois Tool Works	ITW	12,82%	45,65%
Johnson Controls	JCI	32,12%	26,75%
L3 Tech	LLL	45,03%	41,10%
Lockheed Martin	LMT	42,01%	75,75%
Southwest Airlines	LUV	23,01%	29,98%
3M	MMM	22,87%	33,01%
Northrop Grumman	NOC	24,76%	41,05%
Norfolk Southern	NSC	46,30%	45,00%
PACCAR	PCAR	58,48%	56,00%
Parker-Hannifin	PH	26,00%	30,50%
Republic Services	RSG	46,58%	47,93%
Raytheon	RTN	33,06%	33,75%
Stanley Black Decker	SWK	39,65%	37,21%
Textron	TXT	68,40%	47,22%
Union Pacific	UNP	36,04%	34,48%
United Parcel Service	UPS	20,48%	76,10%
United Technologies	UTX	29,37%	40,67%
Waste Management	WM	57,73%	61,83%

Graph 73: Average D/E Firms Industrial, 2003-2006 & 2012-2015 (Source, Bloomberg)



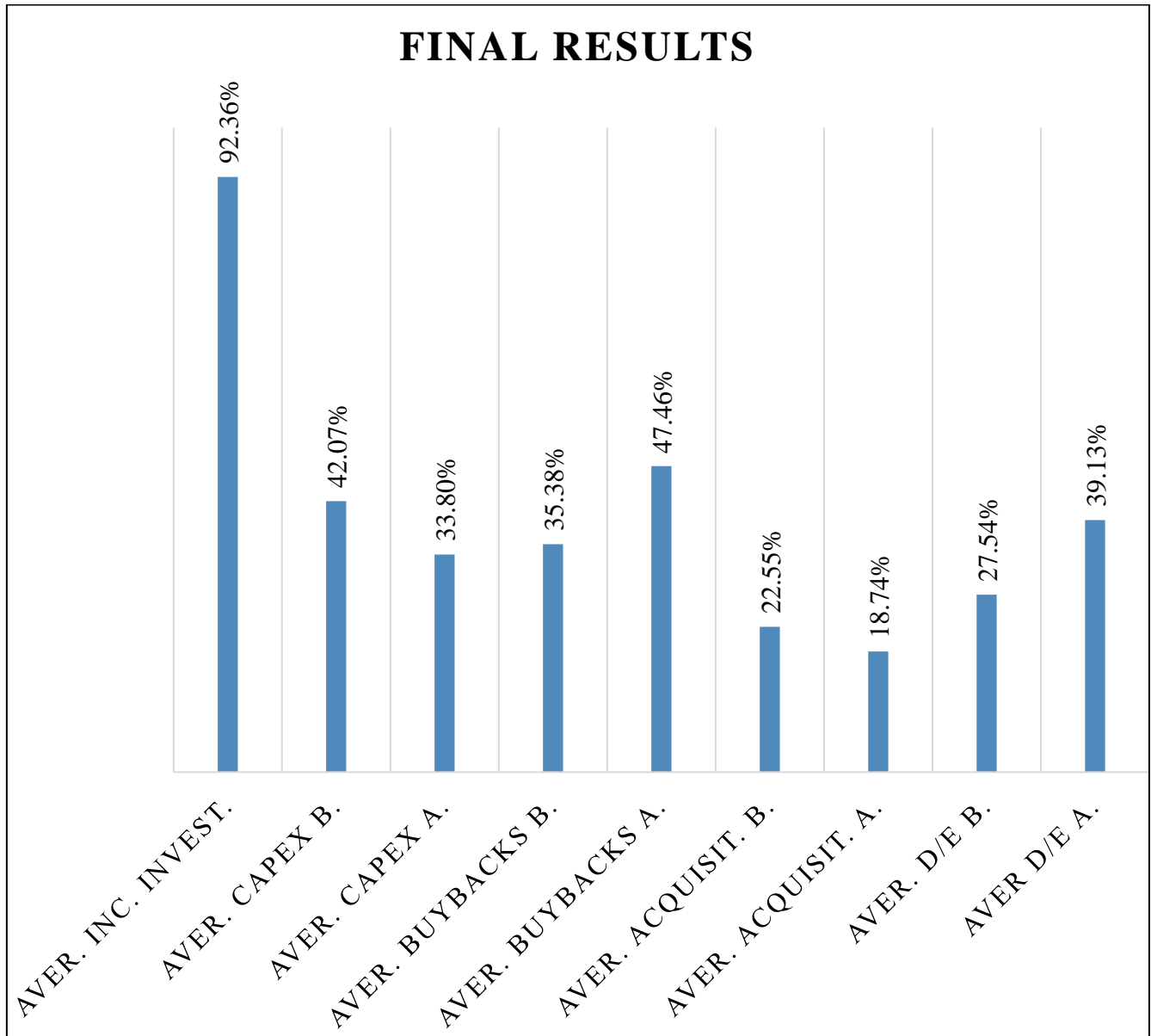
Graph 74: Average Capex/Buybacks/Acquisitions Firms Industrial ,2003-2006 & 2012-2015 (Source, Bloomberg)



As in the other sectors, as you can see in the graph X , how the Total Debt of the firms in the post-crisis period, 2012-2015, has increased of 15% compared to the pre-crisis period, 2003-2006; regard the investments in the graph X, seen the increase of Average Inc. Investment (62,27%, this factor is the result of innumerable macroeconomic and microeconomic variables), the average of investments in Capex and Acquisition decrease (as in the Communication Services sector), while the average of investments on Buybacks increase by 13% basis points.

3.3.4 Final Average Results

Graph 75: Final Average Results, 2003-2006 & 2012-2015 (Source, Bloomberg)



As you can see from the graph X, the D/E average of those industries has increased after the crisis by 12% basis points, this lead to understand how much the Quantitative Easing and so the lower cost of debt affects the debt of different sectors! The firms raised more debt and this lead to an increase of investment in the total amount, as already exposed before for each sector analysis.

Now let's going to look, with the numbers how the investment changes between the pre-crisis period, 2003-2006, and the post-crisis period, 2012-2015:

- Investment Average: the average of investments increase by 92,36% basis point; this means that the firm, in the post-crisis period, invest more than twice total amount, compare to the pre-crisis period. It's important to say that this average is influenced not only by the Quantitative Easing (this is one of the main increase reason), but also by infinite other variables, which differ from sector to sector and from firm to firm too!
- Capital Expenditures (Intern Investment) Average: the average of Capex Investments decrease by 9% basis points, this means that the firms invested less on Capex compare to the pre-crisis period; the major amount invest by the firm wasn't put there (on this section of investments).
- Buybacks Average: the average of Buybacks Investments increase by 12% basis points compare to the pre-crisis period, this is the only Investment section increase! This means that the companies in the post-crisis period prefer to remunerate the stakeholders despite invest internally or externally.
- Acquisitions Average: the average of Acquisition Investments decrease by 4% basis point in the post-crisis period compare to the pre-one. This means that the companies spend less for acquisitions even if the number of transactions is almost the same to 2007 (the pre-crisis peak); the average is negative even if the Acquisition Investments Average in the Information Technology sector increase.

Now there will be all the table with the data of sectors and firms used to extrapolate those averages (used in the last graphs).

Conclusion

The thesis started with the question “How and if the Quantitative Easing made by Fed had effects on the internal (Capital Expenditures), external (Acquisition) & Buybacks of firm’s investments”.

In the beginning of the paper, we have analysed the Quantitative Easing by Fed with a depth analysis, to understand if the QE had an impact on the final cost of debt for the firms and consumers; we started with the focuses of the various QE’s steps since the beginning of the crisis until the end of its, then the analysis of the QE in general and of its various transmission mechanism channels. In the last part of the chapter from the focus on nominal spending, corporate bond yield and QE’s impact on firm financing, our studies show how the Quantitative Easing lead to lower interest rates (or lower cost of debt or of fundraising) for firms and consumers.

After the analysis of the Quantitative Easing, in the second chapter of the thesis we have studied the internal, external & Buybacks firm’s investments in a theoretical way and their trend through the pre-crisis (2003-2006) and post crisis (2012-2015) period. First we have analysed the M&A starting from the definition and from an academic literature view, then there is a focus on the M&A’s trends in the pre-crisis period, 2003-2006 (not so in specific), and in the post crisis one, 2012-2015 (the analysis was made in specific, with the analysis of each year made in a World perspective and in a specific US perspective). In the last part of the central part we have focused on the definition and on the academic literature review of Capital Expenditures and Buybacks (we made also a short trend analysis related to the quantity made of those latter since the beginning of the century until 2018). All the analysis in this central part is made to understand better the last part of the thesis, the third chapter, the thesis’ core.

The third chapter is the “heart” of the thesis, inside there is the numerical analysis of the firm’s investments (internal, external & Buybacks). To made the analysis we have chosen three sectors (Communication Services, Information Technology and Industrial) and 66 firms, the basket is not so big due to the difficulty to find firms with available data since the pre-crisis (2003-2006) until the post-crisis period (2012-2015) and with a relevant “size” (related to market capitalization and revenues). In the first part, there is a focus on macroeconomic

condition and Index trend, Dow Jones and S&P 500 (in the pre-crisis and post-crisis period), then there is the analysis of each sector selected for the thesis with focuses on their relative S&P 500 Index.

The analysis was conducted with the studies of each firm's cash outflows related to Capex, Acquisitions & Buybacks; and with the studies of the debt, to understand if the QE, effectively, lead the firms to raise more debt. Our studies lead us to the assertion that the firms have more debt in the post-crisis compare to the pre-crisis period (this support the hypothesis of how the QE, with the lower cost of debt, lead the firms to raise more debt); and the firm's investments change, with the decrease of internal and external investments (Capex and Buybacks) and an increase in the Buybacks (the shift is referred to the post crisis period compare to the pre-crisis one).

This lead to the conclusion that the firms during the QE have raised more debt compare to the pre-crisis period conditions; but this debt wasn't use for incrementing internal or external investments, but for remunerating shareholders. The only sector with an increase in the external investments was the Information Technology sector, related to the consolidation of the sector (remember that this sector is "young" compare to the others, and with a lot of firm's turnover) with the creation of new "Big Players"; the most important, among all, nowadays is Apple, which is the classic example of how a market could change radically in a short time (ten years).

All of this means that, maybe, the industry has achieved is maximum level of expansion in term of "global dimension", with strong consequences on the labour market (this achievement brings the firms to not create new job places). The analysis of the thesis is from 2012 to 2015, related to the post-crisis period, without considering the last years (2016-2018); those last years are the most important because the firms continue preferring to remunerate shareholders instead of growing internal or external investments, in fact in the last years (2018) the shares buyback are reached the highest level with a new record value of 1100 billions of dollars¹¹². In fact, the "big fiscal stimulus" made by Trump, with the hope of new job places creation is failed (compare to the number reported by Trump before the programme beginning) due to the preference of firms to invest in shares buybacks instead of infrastructural investments. This open a new scenario, for our point of view pessimistic, in which the market is in a strong bearish trend of all the index (from the industrial, Dow Jones, to the technological one, Nasdaq) and with a lot of problem didn't resolved yet as:

¹¹² <https://www.cnbc.com/2018/12/18/stock-buybacks-hit-a-record-1point1-trillion-and-the-years-not-over.html>

- The commercial war between China & USA: which will impact a lot on the US firm's revenues (due to the globalisation and so of the Chinese market importance for the American's companies).
- The very slow growth of Europe: the UE's growth is slow, even if it's not more the most important market, this one is still considered as a key indicator of the economy's health (must be said that our country is in recession today!)
- The fear of Chinese market collapse: many investors are feared by the threat of a new big financial crisis due to the collapse of Chinese market, and given the importance of this market the successively fall of American and European one.

The conclusion to the thesis' question is that the investment, as the debt, due to the crisis and Quantitative Easing are changed; however, our thesis is made in the broad strokes and not with a regression analysis with incidence of debt on the firm's investments, and with a basket of companies not so "strong" for an empirical analysis through all the US market. Our biggest displeasure is the lack of time and resources to make a strong and depth analysis on the topic, which is very interesting.

Bibliography

- Adrian & Shin (2008); Financial intermediaries, financial stability, and monetary policy; FRB of New York Staff Report
- Bauer & Rudebusch (2014); The signalling channel for Federal Reserve bond purchases; International journal of central banking
- Beaudry, Dupaigne & Portier (2008); The International propagation of news shocks; Center for economic policy and research discussion papers
- Bernanke (2012); Monetary policy since the onset of the crisis; Federal Reserve Bank of Kansas City Economic Symposium
- Bernanke & Blinder (1988); Credit, Money, and Aggregate Demand; The American Economic review papers and proceedings
- Bernanke & Kuttner (2005); What explains the stock market's reaction to federal reserve policy?; The journal of finance
- Bernanke & Reinhart (2004); Conducting monetary policy at very low short term interest rates; Presented at the meetings of the American Association
- Blinder (1999) Central Bank Credibility: why do we care? How do we build it?
- Boivin, Kiley and Mishkin (2010); How was the monetary transmission mechanism evolved over time?; Federal Reserve Board
- Bowdler & Radia (2012); Unconventional monetary policy: the assessment; Oxford Review of Economic Policy
- Debes, Gareis, Mayer & Ruth (2014); Confidence and the transmission of monetary policy shocks; University of Wuerzburg, Department of Economics, Sanderring, Wuerzburg Germany
- Disyatat (2011); The bank lending channel revisited; Journal of Money, Credit and Banking
- Dobbs, Lund, Koller & Shwayder (2013); QE and ultra-low interest rates: distributional effect and risk; McKinsey
- Fawley & Neely (2013); Four stories of Quantitative Easing; Federal Reserve Bank St. Louis
- Federal Reserve Official Report, 2008
- Federal Reserve Official Report, 2009
- Federal Reserve Official Report, 2010
- Federal Reserve Official Report, 2011
- Federal Reserve Official Report, 2012

- Federal Reserve Official Report, 2013
- Federal Reserve Official Report, 2014
- Fedspeak (2004); Remarks at the meetings of the American Economic Association, Bernanke, San Diego California
- Fei (2011); The confidence channel for the transmission of shocks; ENSAE Paristech in France and Humboldt Universitat zu Berlin
- Foley-Fisher, Ramcharan and Yu (2014); The impact of Unconventional Monetary Policy on Firm Financing Constraints: Evidence from the Maturity Extension Program; Federal Reserve Board Philadelphia.
- Fratzscher, Lo Duca & Straub (2013); On the international spillovers of US Quantitative Easing
- Friedman & Schwartz (1963); A monetary history of the United States
- Gabriel & Lutz (2014); The impact of unconventional monetary policy on real estate markets; SSRN 2493873
- Hattori (2014); Tail-risk perceptions around unconventional monetary policy announcements; BIS quarterly review
- Hausken & Ncube (2013); Quantitative Easing and its impact in the US, Japan, the UK and Europe; Springer
- Holod & Peek (2007); Asymmetric information and liquidity constraints: a new test; Journal of Banking & Finance
- Hørgren (1995); Monetary policy in theory and practice; Quarterly Review
- Janssen, Potjagailo & Wolters (2014); Monetary policy during financial crises: Is the transmission mechanism impaired?; University of Kiel and Kiel Institute for the World Economy
- Joyce, Miles, Scott & Vayanos (2012); Quantitative Easing and Unconventional monetary policy?; The Economic Journal
- Kashyap & Stein (1995); The impact of monetary policy on bank balance sheets; Carnegie-Rochester conference series on public policy
- Kiley (2014); The response of equity prices to movements in Long-Term interest rates associated with monetary policy statements: before and after the zero lower bound; Journal of money credit & banking
- Kpmg M&A report, 2012
- Kpmg M&A report, 2013
- Kpmg M&A report, 2014
- Kpmg M&A report, 2015

- Krishnamurthy & Vissing-Jorgensen (2011); The ins and outs of LSAP's; Federal Reserve Bank
- Leduc (2010); Confidence and the Business Cycle; FRBSF economic letter
- M. Friedman (1962); "In search of a monetary constitution"; Yeager.
- Molyneux & Wilson (2015); The Oxford handbook of banking; Oxford University Press
- Montes (2009); Reputation, credibility and monetary policy effectiveness; Estudos Economicos Sao Paulo
- Neely (2010); Unconventional monetary policy had large international effects; Journal of Banking & Finance
- Neely (2015); Unconventional monetary policy had large international effects; Journal of Banking & Finance
- OECD, 2009a. OECD Economic Outlook, 2(86), OECD, Paris.
- Peek & Rosengren (1995); Bank lending and the transmission of monetary policy; Conference Series-Federal Reserve Bank of Boston
- Roche (2014); Understanding Quantitative Easing; Ovidius University Annals, Series economic sciences
- Romer (2009); Fiscal policy and economic recovery; Business Economics
- Swanson, Reichlin & Wright (2011); A high frequency event study analysis of operation twist and its implications for QE2; Brookings Institution Press
- Williams (2012); The federal reserve's unconventional policies; FRBSF Economic letter
- Woodford (2012); Methods of policy accommodation at the interest-rate lower bound; Columbia University
- Wright (2011); What does monetary policy do at the zero lower bound; NBER working paper

Sitography

- Bloomberg Database
- Central bank asset purchase I: the theory. König, Bernoth & Raab (2015)
- DataStream Database
- Did Quantitative Easing boost bank lending? Butt, Churm & McMahon, <http://bankunderground.co.uk/2015/07/17/did-quantitative-easing-boost-bank-lending/> (2015)
- Federal Reserve Official Site, [federalreserve.gov/monetarypolicy/bst_openmarketops.htm](http://www.federalreserve.gov/monetarypolicy/bst_openmarketops.htm)
- http://www.diw.de/de/diw_01.c.500157.de/presse/diw_roundup/central_bank_asset_purchase_i_the_theory.html
- <https://www.cnbc.com/2018/12/18/stock-buybacks-hit-a-record-1point1-trillion-and-the-years-not-over.html>
- <https://corporatefinanceinstitute.com/resources/knowledge/accounting/capital-expenditures/>, Corporate Finance Institute
- <https://fred.stlouisfed.org/series/GDPC1>
- <https://it.investing.com>
- <https://it.tradingview.com>
- <https://it.tradingview.com/symbols/DJ-DJI/>
- <https://it.tradingview.com/symbols/SPX/>
- IMMA Institute
- Milano Finanza 24/07/2018, milanofinanza.it/news/entro-il-2018-in-venezuela-inflazione-a-un-milione-percento-201807242046294290
- What the Fed did and why: supporting the recovery and sustaining price stability, Bernanke, The Washington Post (2010, <http://washingtonpost.com/wp-dyn/content/article/2010/11/03/AR2010110307372.html>)
- What the Fed did and why: supporting the recovery and sustaining price stability, Bernanke, The Washington Post (2010, <http://washingtonpost.com/wp-dyn/content/article/2010/11/03/AR2010110307372.html>)
- Zephyr, Bureau Van Dijk

Index Graphs

- Pag. 21 Graph 1: Assets and Liabilities held by Fed from 2008 to 2015
- Pag. 26 Graph 2: Quantitative Easing Transmission Mechanism
- Pag. 30 Graph 3: Portfolio Rebalancing Channel, source Joyce (2012)
- Pag. 36 Graph 4: The CCC chain, confidence strategy (Source: Wray and Forstater 2006)
- Pag. 40 Graph 5: Portfolio Rebalancing Channel, source Joyce (2012), repeated
- Pag. 42 Graph 6: The actors' process (source: Butt, Churm and McMahon, 2015)
- Pag. 47 Graph 7: QE1, corporate bond's yields and treasury rates (Source, DataStream)
- Pag. 48 Graph 8: QE2, corporate bond's yields and treasury rates (Source, Datastream)
- Pag. 48 Graph 9: QE3, corporate bond's yields and treasury rates (Source, Datastream)
- Pag. 49 Graph 10: Tapering, corporate bond's yields and treasury rates (Source, Datastream)
- Pag. 52 Graph 11: Consumer Confidence Survey (Source, Organization for Economic Co-Operation and Development)
- Pag. 52 Graph 12: Agents Confidence (Source, Organization for Economic Co-Operation and Development)
- Pag. 54 Graph 13: Q1 and S&P 500 index (Source, S&P Dow Jones Indices LLC)
- Pag. 55 Graph 14: Q2 and S&P 500 index (Source, S&P Dow Jones Indices LLC)
- Pag. 55 Graph 15: Q3 and S&P 500 index (Source, S&P Dow Jones Indices LLC)
- Pag. 56 Graph 16: Tapering and S&P 500 index (Source, S&P Dow Jones Indices LLC)
- Pag. 56 Graph 17: S&P 500 index from 2005 to 2015
- Pag. 70 Graph 18: M&A Activity 1985-2018 (Source: IMAA Institute)
- Pag. 71 Graph 19: US, Total number of transactions and values of them (Source: IMAA Institute)
- Pag. 72 Graph 20: US, Transaction and Value of M&A market, 2012-2015 (Source: IMAA Institute)
- Pag. 73 Graph 21: US, M&A market transactions, 2012-2015 (Source: IMAA Institute)
- Pag. 73 Graph 22: US, M&A market values, 2012-2015 (Source: IMAA Institute)
- Pag. 74 Graph 23: Value of M&A Activity 2012 and S&P 500 index (Source Kpmg report, 2012)
- Pag. 75 Graph 24: Transactions M&A, 2000-2012 with target's geographic area (Source Kpmg report, 2012)

- Pag. 75 Graph 25: Value M&A, 2000-2012 with target's geographic area (Source Kpmg report, 2012)
- Pag. 76 Graph 26: Top Ten Operations related to the sector (Source Kpmg report, 2012)
- Pag. 77 Graph 27: Top Ten Operations related to the geographic area (Source Kpmg report, 2012)
- Pag. 77 Graph 28: Top deals in US (Source Kpmg report, 2012)
- Pag. 78 Graph 29: M&A activity, American Market, related to the Sector (Source Kpmg report, 2012)
- Pag. 79 Graph 30: Value M&A, 2003-2013 with target's geographic area (Source Kpmg report, 2013)
- Pag. 80 Graph 31: Transactions M&A, 2003-2013 with target's geographic area (Source Kpmg report, 2013)
- Pag. 81 Graph 32: M&A activity, World, related to the Sector (Source Kpmg report, 2013)
- Pag. 81 Graph 33: IPO, world, 2007-2013 (Source Kpmg report, 2013)
- Pag. 82 Graph 34: Top five deals in America (Source Kpmg M&A report, 2013)
- Pag. 82 Graph 35: M&A activity, American Market, related to the Sector (Source Kpmg report, 2013)
- Pag. 83 Graph 36: Domestic and Abroad M&A activity, 2003-2013 (Source Kpmg report, 2013)
- Pag. 84 Graph 37: Value M&A, 2004-2014 with target's geographic area (Source Kpmg report, 2014)
- Pag. 85 Graph 38: Transactions M&A, 2004-2014 with target's geographic area (Source Kpmg report, 2014)
- Pag. 85 Graph 39: M&A activity per sector & world, compared 2013 to 2014 (Source Kpmg report, 2014)
- Pag. 86 Graph 40: Top operations in USA, 2014 (Source Kpmg report, 2014)
- Pag. 87 Graph 41: Domestic and Abroad M&A activity, 2007-2014 (Source Kpmg report, 2014)
- Pag. 87 Graph 42: M&A activity per sector, America, transactions and values (Source Kpmg report, 2014)
- Pag. 88 Graph 43: Value M&A, 2005-2015 with target's geographic area (Source Kpmg report, 2015)
- Pag. 89 Graph 44: Transactions M&A, 2005-2015 with target's geographic area (Source Kpmg report, 2015)

- Pag. 90 Graph 45: M&A activity per sector, world, compared 2014 to 2015 (Source Kpmg report, 2015)
- Pag. 91 Graph 46: M&A activity per sector, America 2015, transactions and values (Source Kpmg report, 2015)
- Pag. 92 Graph 47: Top operations in USA, 2015 (Source Kpmg report, 2015)
- Pag. 92 Graph 48: M&A market transactions and values, USA 2007-2015 (Source Kpmg report, 2015)
- Pag. 97 Graph 49: Buybacks from 2005 to 2016, historical yield, TTM buybacks and S&P 500 multiple (Source SeekingAlpha, 2018).
- Pag. 99 Graph 50: Dow Jones Index 2003-2015 (Source, <https://it.tradingview.com/symbols/DJ-DJI/>)
- Pag. 99 Graph 51: Annual Growth Dow Jones, pre-crisis and post-crisis (Source, it-investing.com)
- Pag 100 Graph 52: Dow Jones Index 2003-2006 (Source, <https://it.tradingview.com/symbols/DJ-DJI/>)
- Pag. 100 Graph 53: Dow Jones Index 2012-2015 (Source, <https://it.tradingview.com/symbols/DJ-DJI/>)
- Pag. 101 Graph 54: S&P 500 Index 2003-2015 (Source, <https://it.tradingview.com/symbols/SPX/>)
- Pag. 102 Graph 55: S&P 500 Index 2003-2006 (Source, <https://it.tradingview.com/symbols/SPX/>)
- Pag. 102 Graph 56: S&P 500 Index 2012-2015 (Source, <https://it.tradingview.com/symbols/SPX/>)
- Pag. 103 Graph 57: Annual Growth S&P 500, pre-crisis and post-crisis (Source, it-investing.com)
- Pag. 103 Graph 58: Annual Growth GDP US, pre-crisis and post-crisis (Source, it-investing.com)
- Pag. 104 Graph 59: USA GDP trend from 2003-2015, (Source, <https://fred.stlouisfed.org/series/GDPC1>)
- Pag. 107 Graph 60: Trend Communication Services Index \$SRTS, 2003-2006 (Source, it.tradingview.com)
- Pag. 107 Graph 61: Trend Communication Services Index \$SRTS, 2012-2015 (Source, it.tradingview.com)
- Pag. 108 Graph 62: Trend Communication Services Index \$SRTS, 2003-2015 (Source, it.tradingview.com)

- Pag. 108 Graph 63: Trend Information Technology Index \$SRIT, 2003-2006 (Source, it.tradingview.com)
- Pag. 109 Graph 64: Trend Information Technology Index \$SRIT, 2012-2015 (Source, it.tradingview.com)
- Pag. 109 Graph 65: Trend Information Technology Index \$SRIT, 2003-2015 (Source, it.tradingview.com)
- Pag. 110 Graph 66: Trend Industrial Index \$SRIN, 2003-2006 (Source, it.tradingview.com)
- Pag. 110 Graph 67: Trend Industrial Index \$SRIN, 2012-2015 (Source, it.tradingview.com)
- Pag. 111 Graph 68: Trend Industrial Index \$SRIN, 2003-2015 (Source, it.tradingview.com)
- Pag. 114 Graph 69: Average D/E Firms Communication Services,2003-2006 & 2012-2015 (Source, Bloomberg)
- Pag. 114 Graph 70: Average Capex/Buybacks/Acquisitions Firms Comm. Services,2003-2006 & 2012-2015 (Source, Bloomberg)
- Pag. 116 Graph 71: Average D/E Firms Information Technology, 2003-2006 & 2012-2015 (Source, Bloomberg)
- Pag. 116 Graph 72: Average Capex/Buybacks/Acquisitions Firms Information Technology ,2003-2006 & 2012-2015 (Source, Bloomberg)
- Pag. 119 Graph 73: Average D/E Firms Industrial, 2003-2006 & 2012-2015 (Source, Bloomberg)
- Pag. 119 Graph 74: Average Capex/Buybacks/Acquisitions Firms Industrial ,2003-2006 & 2012-2015 (Source, Bloomberg)
- Pag. 120 Graph 75: Final Average Results, 2003-2006 & 2012-2015 (Source, Bloomberg)

Index Tables

Pag. 23 Table 1: Federal Reserve Balance Sheet, 2007-2009 (Source, Federal Reserve)

Pag. 46 Table 2: The change of yields correlated to any important QE's event (Source, Datastream)

Pag. 57 Table 3: S&P 500 index data from the Q1 to Tapering

Pag. 59 Table 4: Summary Statistics before 2007 (Source Foley-Fisher, Ramcharan and Yu, December 2014)

Pag. 61 Table 5: Long-term debt and abnormal returns, regression analysis (Source Foley-Fisher, Ramcharan and Yu, December 2014)

Pag. 63 Table 6: Change in firm's long term debt during MEP (Source Foley-Fisher, Ramcharan and Yu, December 2014).

Pag. 113 Table 7: Firms Communication Services and D/E, 2003-2006 & 2012-2015 (Source, Bloomberg)

Pag. 115 Table 8: Firms Information Technology and D/E, 2003-2006 & 2012-2015 (Source, Bloomberg)

Pag. 118 Table 9: Firms Industrial and D/E, 2003-2006 & 2012-2015 (Source, Bloomberg)

