“Dead in the Short Run:
The Global Financial Crisis
and the Failure of Economic Policy”

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Declaration of Originality

This dissertation is my own original work and has not been submitted for any assessment or award at University of Manchester or any other university.

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Abstract

More than six years after the beginning of the longest and the most painful period of financial instability and economic turmoil since the Great Depression, economic recovery still remains hesitant and uneven. This dissertation seeks to provide an answer to two fundamental questions: “what caused the Global Financial Crisis?”, and “are the policies adopted to foster economic recovery working?”. The paper provides a theoretical discussion of the short-term and long-term causes of the Financial Crisis, describes the post-crash macroeconomic environment and its effects on the economic policies available to policy-makers, and provides a comparative analysis of the Global Financial Crisis and the Japanese crisis of the 1990’s. It also presents the results of quantitative assessment of conventional monetary policy, quantitative easing, and fiscal stimulation.

This dissertation identifies the originate-to-distribute lending model, leveraged speculation on financial derivatives, the actions of the Government Sponsored Entities, and the policy framework associated with the Great Moderation as the main roots of the imbalanced economic environment, in which the Crisis could have occurred. Furthermore, it recognises a number of similarities between the Global Financial Crisis and the Japanese crisis of the 1990’s as far as both their causes and the policy responses to them are concerned. Finally, it emphasises the need for fiscal consolidation in advanced economies, while proving that quantitative easing has fairly limited effects on recovery prospects.
Preface

It has been more than six years since the beginning of the most painful and long-lasting period of financial instability and economic downturn since the Great Depression, and yet, despite tremendous efforts of the peoples and governments of the countries most affected by the Global Financial Crisis, economic recovery still remains very weak and fragile (Sullivan, 2009; Siegel, 2009). The Crisis and the subsequent recession have been extremely costly thus far – it is impossible to provide even an approximation of this cost, as apart from trillions of pounds lost due to the decline of stock markets across the world, as well as due to the extensive bail-out and stimulus programmes carried out in the most endangered economies, the turmoil in the financial markets has cost millions of people their jobs, their homes, and their future prospects (Financial Crisis Inquiry Commission, 2011). One thing, however, is certain: this particular crisis and recession has already had an impact affecting not only the current generation, but also the one that will follow.

Neither the financial markets, nor the policy makers were prepared for the possibility that a crisis of such a magnitude and with such devastating effects could happen. The sudden and unanticipated collapse of the global markets, and the sheer scale of the crisis that it spurred, has also taken the vast majority of professional economists aback. There were, however, voices of concern that predicted the collapse of the housing market and a subsequent recession as early as in 2003, raised most notably by Professors Robert J. Shiller and Karl E. Case, and by Dr Nouriel Roubini. In their paper “Is There a Bubble in the Housing Market?” Case and Shiller (2003) analysed the data on house prices in the biggest metropolitan areas in the United States, and noticed that since 1995 they were rising much faster than incomes and virtually all other prices. Their concluding remarks were rather worrying, stating that property prices would probably stall at one point or even decline in some cities, which would have tragic consequences for heavily indebted individuals, starting a wave of personal bankruptcies. What happened between 2007 and 2009 exceeded their worst expectations by far.
Dr Roubini predicted the deflation of the housing bubble followed by a severe recession in 2005, an issue he has discussed many times since. In 2006, he spoke at the International Monetary Fund conference warning about the United States “facing a once-in-a-life-time housing bust, an oil shock, sharply declining consumer confidence and, ultimately, a deep recession” (Mihm, 2008). He anticipated an increasing number of defaults on home mortgages, trillions of dollars of mortgage-backed securities becoming worthless, and, finally, the global financial system coming to a halt, which in effect would annihilate various hedge funds, investment banks, and other financial institutions (Roubini, 2010). Although back in 2006 his predictions were met with a healthy dose of scepticism, the harsh reality of the financial crisis that began merely a year later has clearly matched his forecasts. Unfortunately, only a very narrow group of economists, finance professionals, and policy makers shared the seemingly unjustified apocalyptic view of the future of the financial markets, and so the world was largely unprepared for the oncoming collapse of the housing market and the devastating shockwaves it would send across the globe.

The issue described above, that is, whether the financial crisis could have been avoided or at least predicted, was only one of the many themes of the academic and political debate that followed immediately afterwards. Other important questions raised in this debate range from that of what exactly caused the crisis and who is to blame for it, through the steps that have to be taken in order to curb the recession and foster economic growth, to the regulatory and policy changes that have to be adopted in order to prevent a crisis of a similar nature from reoccurring. It is a confrontation between various schools of economic thought, supporters of left-wing and right-wing political policies, and even between the rich and the poor of the world. Bearing in mind, however, that many economists and policy makers still disagree about the causes of the Great Depression, and about the appropriate policy responses to it and their effectiveness, even though it happened almost a century ago (see Friedman, 2002; Siegel, 2009; Stiglitz, 2010; Wapshott, 2011), this debate will surely carry on in the foreseeable future.

The subject of this dissertation is of no small importance to the people and governments of the developed Western nations. In 1923, in his “Tract on Monetary Reform”, John Maynard Keynes famously stated that “in the long run we are all dead”
Although he was referring primarily to the fact that contrary to the beliefs of classical economists, macroeconomics and its tools should principally focus on short-term economic fluctuations, I believe that given the current very difficult economic conditions that render many of the policy tools useless, it is fair to paraphrase him by saying that right now we are dead in the short run. Providing an explanation of how we arrived at this situation, together with answering at least some of the questions mentioned above is the main aim of this dissertation.

With the Crisis still far from over, there is a clear need for further research into the subject, as the more we know about it and the better we understand its nature, the more effectively can it be tackled to promote further recovery and economic growth. This dissertation has been written with the above statement in mind, and attempts to provide answers to the following questions:

1. What were the immediate causes of the Global Financial Crisis?
2. How did the economic policy followed in the years leading up to the meltdown of financial markets contribute to the escalation of the problem?
3. How did the post-crash economic environment influence the shape and design of the policies implemented to counteract the Recession?
4. Are those policies effective? Have they had a significant impact on economic recovery?
5. Was the Crisis truly unprecedented?

Put shortly, an analysis of the role that the economic policy followed by the Western developed nations prior to 2007 played in the making and escalation of the Crisis, together with the policy responses to it, and an assessment of their effectiveness remains the ultimate objective of my work.

In order to set the stage for further discussion, the first chapter focuses on the Global Financial Crisis itself, identifying its immediate causes and consequences, and providing a brief overview of its evolution over time. The economic vulnerabilities that sparked the crisis, however, were years in the making, as the policies adopted so as to fuel and sustain the economic expansion almost indefinitely, primarily by creating a virtually riskless society, simultaneously contributed to the formation of an
asset bubble and the weakening of the soundness of the global financial system, which is the subject of the second chapter.

The following chapter centres on the reaction of the policy makers to the crisis – in 2008 the world was forced to choose between two equally painful alternatives of either allowing its financial system to collapse, or injecting trillions of pounds of taxpayers’ money into the system to provide emergency funding to an increasing group of companies. Some decisions were a necessary evil that provided short-term stability but had undesirable long-term effects, turning one problem into another. For example, the decision to bail out or nationalise the most endangered institutions might have improved the short-term stability of the financial system, however, it has also contributed to the rising levels of public debt in the United States, and in the United Kingdom, forcing those countries to adopt severe austerity measures in order not to default on their sovereign debt – a problem which thus far has cost them both their highest AAA credit ratings.

The fourth chapter offers an insight into the Japanese housing bubble of the early 1990s and its “lost two decades” that followed. As George Santayana famously said, “those who cannot remember the past are condemned to repeat it” (1905: p. 284). The crisis and the economic stagnation that Japan has experienced are remarkably similar to the Global Financial Crisis and the ongoing turmoil, both as far as their causes and the policy responses are concerned. There are lessons to be learnt from the Japanese experience of the last two decades, particularly regarding the subject of the subsequent chapter, the unconventional monetary policy.

Finally, the sixth chapter outlines the methodology and the results of my empirical work aimed at assessing the effectiveness of policies adopted post 2009 in order to foster economic growth in the post-crisis period. It is followed by a brief review of the discussion presented in this dissertation, which at this point can be summarised by a quote from Reinhart and Rogoff’s book “This Time is Different”: “Debt-fuelled booms all too often provide false affirmation of a government’s policies, a financial institution’s ability to make profits, or a country’s standard of living. Most of these booms end badly.” (Reinhart and Rogoff, 2009b: p. xxv).
Chapter II

The Crisis and the Recession

Figure 1: Major Indices Performance 2007 - 2012

Figure 1 depicts the changes in the values of three market indices of a global importance over the last five years – American Dow Jones Industrial Average, British FTSE100, and Japanese Nikkei 225. The chart depicts the sheer scale of the losses incurred as a direct result of the Global Financial Crisis – the aforementioned indices lost between 50% and almost 70% in their values, as measured from the peak to the trough, within only two years. Following the conclusion of the Second World War, the Western world has experienced years of almost continuous rapid economic growth – with the experience of the Great Depression almost forgotten, reflected primarily by

\(^{1}\) All charts depicting market data are the author’s own work based on data obtained through Bloomberg Database, unless indicated otherwise.
The contents of history textbooks, a market decrease of this scale was absolutely unprecedented and unanticipated.

The Global Financial Crisis is one of the rare cases when a financial crash triggers an economic recession, rather than the other way around. Finance and economics, however, are very closely related, almost intertwined, with one affecting the other, and therefore an investigation of the economic policy followed in the years leading up to a crisis frequently sheds some light on the causes of a financial crash. This issue is analysed in this and the following chapter of this dissertation, with the former focusing on the more immediate causes of the crisis, and the latter on the economic factors that created an imbalanced environment in which it could have occurred. Although the main focus of this chapter is placed on the American mortgage and stock market, primarily because it was where the Global Financial Crisis originated, the issues discussed below were much more widespread and took place in almost all countries affected by the Crisis.

One of the most important factors affecting the behavioural patterns of market participants is their attitude towards risk, which means that their actions will be defined largely by their perception of the current systemic risk in the market. Before the discussion presented in this chapter moves on to the analysis of the causes of the Global Financial Crisis, it is worth looking into the attitude that dominated the financial markets in the years leading up to their meltdown.

This of course leads to one important question: is it possible to express someone’s attitude towards risk in a quantitative manner? After all, as any other personal preference, it varies with every individual. In the early 1990s, however, using the data on S&P100 Index option prices, R.E. Whaley developed the Chicago Board Options Exchange Market Volatility Index, known as the VIX Index, or the investor fear gauge.

As explained by Whaley (2009), the VIX is a forward looking measure of expected stock market volatility over the next 30 days implied by the current price of options on S&P500 Index. Although volatility is a measure of unexpected upward or downward market movements, S&P500 index put options are commonly used by hedgers, particularly when they believe that the value of their portfolio will decrease in the future (Whaley, 2009). An increase in demand for put options increases their
price and implied volatility, and hence it is reasonable to conclude that the higher expected stock market volatility implicated by option prices corresponds to higher levels of fear among investors.

Figure 2 depicts the values of the VIX Index between January 1990 and December 2012. Generally speaking, before the Global Financial Crisis occurred the index value spiked to a level of about 40 – 45% a number of times, only to return to its ‘natural’ level of 15 – 25% (portrayed as blue area in Figure 2) shortly afterwards. The two substantial increases in value that occurred in 1997 and 1998 were a result of a substantial sell-off of stocks and the period of unrest that followed. The next peak occurred in September 2001 and can be associated with the time of widespread anxiety that followed the September 11 terrorist attacks. The increase in the value of the index in that period can also be associated with the deflation of the Internet stocks bubble, and the unravelling of various corporate governance scandals. After 2003, however, the level of the index returned to the region of 10 – 15%, where it remained until early 2007.

The beginning of 2007 marked the first defaults of homeowners’ on their mortgages. What is interesting, however, is the fact that after the period of initial unrest, the index decreased to about 18%, only to rocket to the value of more than 80% in September 2008 following the bankruptcy of Lehman Brothers. It took almost two years for the index to temporarily return to the value of below 20%.

![Figure 2: Investor Fear Index 1990 - 2012](image)
The interpretation of this data is fairly straightforward – it depicts a period of prolonged euphoria and overconfidence of market participants (green area in Figure 2) fuelled by the actions of the Federal Reserve aimed at counteracting the negative effects of the deflation of the dot.com bubble, explained in detail in the next chapter. It was, however, a period of calm before a storm, as the behaviour of the index between 2008 and late 2011 is typical of a widespread panic in the market (red area in Figure 2).

In its report, the Financial Crisis Inquiry Commission (2011) concludes that the Crisis occurred due to a number of factors, most notably:

- Declining mortgage-lending standards and mortgage securitisation;
- Failure to provide adequate credit worthiness assessment by credit rating agencies;
- The impact of over-the-counter derivatives, particularly Mortgage Backed Securities (MBS), Collateralised Debt Obligations (CDO), and Credit Default Swaps (CDS);
- Destabilisation of financial markets due to failures in regulation and supervision;
- Systematic lack of adequate corporate governance and risk management in financial institutions;
- Combination of excessive borrowing, risky investments, and lack of financial transparency;
- Inconsistent response of the governments, which fuelled the uncertainty and panic in the financial markets.

A detailed discussion of all of the aforementioned issues would go far beyond the objectives and the scope of this dissertation, therefore the analysis presented in this chapter will focus only on the most important aspects, offering some basic insights sufficient to gain a good understanding of the underlying problem. Four of the factors identified above, that is declining lending standards, excessive borrowing, mortgage securitisation, and the impact of financial derivatives, will be discussed together, particularly as they represent elements of a cause and effect chain that shook the foundations and the soundness of the financial system.
Siegel (2009) points out that the decline in market values and the losses on a mammoth scale incurred by the once-proud financial institutions, interconnected through a series of complex financial instruments to the extent that the whole global financial system was at the point of collapse, had a very unlikely cause – leveraged speculation on home mortgages.

As explained by Buckley (2011), two decades ago, the lending models used by various banks were based on the originate-to-hold principle, involving issuing a mortgage against the security of a home with the bank receiving regular interest and capital repayments until its maturity. Under this model the bank would hold the mortgage for a very long time, and hence would be very careful about its customers’ ability to repay it by conducting all the necessary credit assessments and due diligence procedures. In the late 1990s, however, this model has been replaced by the originate-to-distribute model, in which the mortgage is no longer held by a bank but instead is sold on to another institution, where a series of similar loans are repackaged and sold further on as a mortgage backed security. The institution which purchased the mortgage might also mix it up with a series of other loans, such as credit card debt, student loan, and corporate loan, and then sell the package as a collateralised debt obligation.

A mortgage backed security is a particular type of an asset backed security, that is an instrument created from a portfolio of income-producing assets, which is then sold to a special purpose vehicle, usually operated by an investment bank or a Government Sponsored Entity allocating the cashflows generated by interest payments and capital repayments to groups of investors, known as tranches (Hull, 2012). A collateralised debt obligation works on a similar principle, however, as pointed out in the previous paragraph, its portfolio of underlying assets includes different types of debt obligations. The creators of MBSs and CDOs assumed that defaults on home mortgages occur randomly and only a few homeowners default in any given time, so a combination of a series of mortgages allows to separate the safe part of mortgages from the risky one without knowing which mortgages would default in the future, ultimately creating a safe tradable security (Temin, 2010). Figure 3 illustrates how MBSs and CDOs work using an example of a portfolio of debt obligations worth £500 million, with an average yield of 10% of interest per year equivalent to £50 million per annum.
As explained by Kilbeam (2010), a typical asset backed security would represent a pool of loans of different quality, including prime mortgages (highest quality of borrower), Alt-A mortgages (risk profile between prime and subprime), and subprime mortgages (issued to clients with the lowest credit rating). The originator of the mortgage would attempt to offset the substantial risk associated with holding loans of poor quality on its balance sheet by selling them to be repackaged as either a MBS or a CDO. The newly created derivative would be divided into tranches corresponding to the riskiness of the underlying assets included in the portfolio of debt obligations.

![Figure 3: A simplified MBS/CDO](image)

The original pool of obligations has a principal of £500 millions divided between the four tranches, with each tranche promised a return on its investment corresponding to its credit rating (the better the rating, the lower the promised returns). Once interest and principal payments on original debt obligations are made, the cashflows generated in the process are distributed by the special purpose vehicle to the participating investors in a process known as the waterfall – the senior tranche is the first one to have its claims settled, then the payment is made to the mezzanine tranche from the funds left over after the first payment, and the process continues until either all claims have been settled or the whole cashflow has been distributed (Hull, 2012).

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Hull (2012) points out, however, that even though the equity tranche promises the highest annual returns, it is the most likely to suffer the losses on its investment. The value of the cashflows distributed between the tranches depends on the value of the underlying assets. Hence, any fall in their value will correspond to a loss of the equity tranche, whereas a fall exceeding 5% (£25m in the example) will mean that the equity tranche investors will not get any money at all. The same principle applies to other tranches, for example a 10% (£50m) decrease in value of the underlying assets will result in some loss incurred by the junior tranche, but a fall of 20% (£100m) or more will mean that their claims will not be settled at all.

This possibility meant that while finding investors willing to purchase AAA-rated senior tranches was not too difficult, finding clients interested in the lower hierarchy tranches was more problematic. In order to overcome this issue, markets introduced variations of collateralised debt obligations, such as CDO\textsuperscript{2}, which is a derivative instrument based upon a package of existing CDOs or tranches of differing CDOs (Pilbeam, 2010). This procedure allowed splitting a BBB-rated junior tranche into a number of other tranches with ratings ranging from AAA to no rating at all.

The fact that a newly originated mortgage would not be kept on the balance sheet of a lending institution, as it was sold on for the purposes of securitisation as soon as possible, meant that under the originate-to-distribute lending model, the assessment of the borrowers’ creditworthiness would not be of a great importance to the originator (Buckley, 2011). Pilbeam (2010) argues that since a mortgage broker was paid an upfront fee for each arranged mortgage, with no possibility of a penalty if the mortgagee went into default later on, the originate-to-distribute model emphasised quantity over quality. Furthermore, he points out that since the vast majority of the subprime mortgages were adjustable rate mortgages, that is mortgages offering low initial interest rates which would increase significantly after one or two years, they attracted a larger proportion of borrowers who would be more likely to default on payments than what was typically expected for Alt-A or prime mortgagees.

Buckley (2011) mentions that even though the traditional mortgage lending criteria had been on the basis of the lower of three times the borrower’s income or 90 to 95% of the value of the property mortgaged, in the run up to the crisis Northern Rock, via its ‘Together’ brand, was offering a deal of 125% based on 95% of the property value
with additional 30% in an unsecured loan and a lending facility based on six times the income.

Credit default swaps were another very important financial derivative instruments that played a major role in the escalation of the Global Financial Crisis. A CDS is a contract that provides insurance against the risk of a default or other credit event by a particular reference entity – the buyer of the insurance obtains the right to sell corporate bonds issued by the reference entity for their face value when a credit event occurs, in exchange for making periodic payments to the seller of the contract until it expires or until a credit event happens (Hull, 2012). Figure 4 provides a graphical representation of a credit default swap.

![Figure 4: Credit default swap](image)

Although compared to any asset-backed security it is a much less complex derivative product, a credit default swap has certain features that make it at least equally interesting.

First of all, as explained by Buckley (2011), a CDS is primarily used to hedge the risk that the reference company will fail to provide capital repayments to the protection buyer, however, it can also be used for speculation purposes – neither of the parties to the contract is required to actually own the underlying asset issued by the reference entity, nor does it have to suffer a loss due to an occurrence of a credit event in order to be eligible to receive the insured amount.

Secondly, unlike in typical insurance contracts, there is no legal limit to the number of CDSs that can be entered into in reference to a particular company – it is therefore possible that despite the reference entity having only £1 million of debt the outstanding CDS contracts on that debt could amount to £100 million or even more.

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Finally, credit default swaps could be written on virtually any type of asset that displayed any probability of a default – ranging from corporate or government issued bonds to mortgage backed securities and collateralised debt obligations.

Similarly to the mortgage backed securities and collateralised debt obligations, the issuers of credit default swaps assumed that defaults occur randomly and irregularly, and therefore the fixed periodic payments should exceed the expected value of the pay-out should a credit event ever occur. Unfortunately, as pointed out by Buckley (2011), what was assumed to be the worst-case scenario happened in real life, and so when a wave of en masse defaults on mortgages and other debt obligations finally took place, what used to be an asset on a financial institution’s balance sheet suddenly became a liability.

The popularity of the three types of derivative instruments described above had profound effects for the whole financial system, particularly when the sheer sizes of their markets have been taken into account. The subprime mortgage market had debt outstanding of $1.3 trillion at its peak, whereas at its highest point the credit default swaps market had $60 trillion outstanding. It can therefore be easily argued that it was the credit default swaps market that served as a catalyst turning a painful but containable crash of subprime mortgages market into a crisis that threatened the existence of the whole global financial system (Buckley, 2011).

The analysis presented thus far in this chapter, identifying the various derivative products as the main drivers of excessive credit growth, is, however, only one side of the coin. In his paper, Wallison (2009) presents an alternative view in which he considers the role played primarily by the government and the two American Government Sponsored Entities, Fannie Mae and Freddie Mac.

Wallison (2009) points out the fact that since the beginning of the 20th century, the United States government had a policy of promoting homeownership by regularly introducing new laws aimed at increasing the volume of mortgages made by banks. Traditionally, when assessing an application for a mortgage, a lending institution would take into account the overall financial position of the applicant, offering lower interest rates for the borrowers of the highest standing, and demanding higher interest payments from those in a more precarious financial position (Cooper, 2010). Once the financial position of an individual becomes so weak that a bank arrives at the
conclusion that there is no viable rate of interest at which a loan could be originated without pushing the borrower further into insolvency, the applicant finds himself in what is known as the poverty trap. In order to address this discrepancy between government policy and private lending policies, in 1977 the United States government adopted the Community Reinvestment Act giving it the powers to deny a bank’s application for expansion if the applicant had failed to lend sufficiently in minority neighbourhoods. Through adaptation of the Community Reinvestment Act the government was effectively forcing commercial banks to take the risks they had previously steered clear of. In effect, the banks were required to suspend their typical prudent lending practices in order to make mortgages more affordable for borrowers who were previously unable to meet the standards in the prime mortgage market. Wallison (2009) argues, however, that the loans initially originated because of the Community Reinvestment Act were not of weak enough quality to produce a financial crisis, although they had triggered off a process of gradual spreading of low quality loans to the rest of the mortgage market – by 2006 almost half of all mortgages originated in the United States were either subprime or Alt-A mortgages.

Fannie Mae and Freddie Mac are two Government Sponsored Entities (GSEs) operating in the United States set up with the purpose of counteracting the issues associated with a poverty trap by providing a consistent supply of mortgage funds. In order to achieve this objective the GSEs would purchase the loans from their originators, and then securitise them while providing a guarantee of timely interest and capital repayments, ultimately selling the newly created mortgage backed security to other investors. This business mechanism established and maintained a constant flow of funds between investors and lending institutions, allowing the latter to issue more loans with lower interest rates due to a guaranteed inflow of funds from the GSEs.

Simkovic (2013) argues that until mortgage backed securities were allowed to be issued by investment banks, the securities created by Government Sponsored Entities were of the highest standard due to the very scrupulous procedures of selecting the affiliated lending institutions, which gave them a degree of control and surveillance over the mortgage market. Wallison (2009), however, presents a point of view contrasting to the one described above, placing the blame for the exuberance of the subprime mortgage market on Fannie Mae and Freddie Mac.
The original objective of these two GSEs was to maintain a liquid secondary market for mortgages, however, by 1992 it was expanded to include promotion of affordable housing. This had profound effects for the whole market, as due to their nature GSEs were able to gain access to virtually unlimited amounts of capital at a very low cost, and because of the specifics of their statutory regulations they were also allowed to maintain a gearing ratio of 60:1 – these advantages allowed them to dominate the market. Wallison (2009) points out that by 2005 the regulations of the Department of Housing and Urban Development required the purchases of Fannie Mae and Freddie Mac to consist of 55% of loans given to low- and moderate income borrowers, and another 25% of loans given to low- or very-low income borrowers, which means that the real work of reducing the quality of lending was done by the GSEs operating to meet the government’s affordable housing regulations.

The funding advantages of Government Sponsored Entities allowed them to dominate investment banks in the housing financing market – until the early 2000s, when Fannie Mae and Freddie Mac began purchasing subprime mortgages in substantial amounts, investment banks were interested only in either jumbo mortgages, which exceeded the size of a loan that the law allowed GSEs to buy, or in junk mortgages (Wallison, 2009). Until 2004 GSEs used to purchase large amounts of AAA-rated tranches of asset backed securities from investment banks, but following a substantial refinancing process that took place in 2003, however, they began buying subprime and Alt-A mortgages directly from their originators in order to avoid paying intermediation fees to investment banks – when a government-backed institution with unlimited funds requests a delivery of low quality loans, it is only natural that the market for them is going to rapidly expand.

The argument presented in Wallison’s paper (2009) can be summarised by saying that Government Sponsored Entities were indirectly responsible for turning a painful housing bubble deflation into a worldwide financial crisis, as they drove the expansion of subprime mortgage market and the inflation of housing prices, which leads to a conclusion that perhaps contrary to the opinion preserving in the media and certain groups within the society, the Global Financial Crisis was not a crisis of capitalism but a crisis of government.
Another issue worth looking into is the degree to which financial institutions increased their gearing in the run up to the crisis. Gearing is one of the commonly used techniques that allows a company to increase its profitability by changing the composition of its balance sheet, most importantly, the proportion of assets to equity. Pilbeam (2010) points out that there is one substantial problem with gearing – even though it increases returns and profits in good times, it also increases the risk levels and therefore the dangers faced by a firm in periods of negative returns. In 2007, Lehman Brothers reported a gearing ratio of 30.7:1 – this value of gearing means that a mere 3% decline in the value of the assets held by the firm would result in losses that have the potential to drive the company into bankruptcy.

Figure 5 illustrates the values of gearing ratios of five major investment banks reported in their annual 10-K forms submitted to the Securities and Exchange Commission. Bearing in mind that finance researchers estimate the value of an optimal gearing ratio for a large investment bank to be between 10:1 and 15:1, the figures presented below show that the excessive borrowing expansion did not take place only in the personal lending market.

![Figure 5: Gearing levels of major investment banks](image)

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4 Based on annual 10-K forms submitted by the analysed companies to the Securities and Exchange Commission between 2003 - 2007
As indicated before, a full analysis of all the issues contributing to creation of the extreme fragility of the financial markets goes far beyond the scope of this dissertation and would not facilitate the analysis of its main topic. For this reason, a range of other important issues of a more legal nature have not been investigated or mentioned – chief among them, the question of the deregulation of financial markets, introduced as part of the Reagan-Thatcher economic model, the one of the consequences of the repeal of Glass-Steagall act, both, as proved by Wallison (2009), with an impact significantly exaggerated by the media (the market for credit default swaps was never formally regulated, so the claims of its “deregulation” are not supported by any legal evidence), and the one of corporate governance of high-profile financial institutions. A careful explanation of the originate-to-distribute model of lending and the impact of complex derivative instruments, as well as other factors driving the growth of subprime mortgage markets, should however be sufficient to provide a basic picture of the growing interconnectedness and fragility of financial markets prior to their crash.

In 2003, Professors Robert J. Shiller and Karl E. Case predicted that the rapid growth in property prices would have come to a stall in the foreseeable future, and with the housing market peaking in the United States in the middle of 2006, it is fair to say they were absolutely correct. Figure 6 depicts the changes in the average value of properties in the twenty biggest metropolitan areas of the United States measured by the Case-Shiller index, and contrasts it with the performance of the S&P500 index.
One rather obvious conclusion that can be drawn from the chart above is that an investment in property would significantly outperform one in the stock market – the value of an average property more than doubled between 2000 and 2006, when at the same time the stock market struggled to regain the value it reached in early 2000s. All market booms, however, end one day, and the housing-market boom was no different. With the value of the underlying assets declining since 2006, the required repayments of mortgages taken to finance the acquisitions of property were increasing beyond the financial capabilities of many borrowers, particularly the NINJAs (No verified Income, Job or Assets) mortgagees. Unsurprisingly then, the beginning of 2007 was marked by a growing number of delinquencies and defaults on subprime and Alt-A mortgages.

By the first week of March 2007, many financial institutions realised that the portfolios of asset-backed securities they were holding on their balance sheets displayed higher delinquencies rates than the ones built into the models used for pricing them (Buckley, 2011). The apparently almost risk-free securities purchased en masse by Government Sponsored Entities, investment banks, and other corporations have suddenly become toxic assets rapidly losing their value. Between April and August 2007, many of the biggest American subprime lending institutions went bankrupt, or narrowly escaped bankruptcy by taking emergency loans worth billions of dollars from other banking firms. The situation in Europe was not any better, as many mortgage companies began to fail as well, or had to be rescued by the government – following a first bank run that happened in Britain in decades since 1866, on the 17th of September 2007 the Chancellor of the Exchequer had to approve government’s guarantee for Northern Rock’s existing deposits. Few weeks later the central banks in the United States, the United Kingdom, the Eurozone, and other economies were forced to announce injections of funds aimed at counteracting freezing up of the short-term lending markets (Buckley, 2011).

As mentioned before, one particular disadvantage of high levels of gearing is that it exposes the firm to increased dangers in the periods of negative returns. Taking into account that many investment banks had used the additional capital raised through gearing to invest in a portfolio of mortgage backed securities, collateralised debt obligations, and credit default swaps, their situation became quite desperate as the
value of the assets held on their balance sheets almost disappeared in a matter of months. One famous example is the forced acquisition of Bear Stearns, a corporation sold to J.P. Morgan Chase for $240 million, an equivalent of less than 1% of what it was worth less than a month before. The Federal Reserve was another party to the settlement, agreeing to underwrite $30 billion of Bear Stearns toxic assets (Pilbeam, 2010).

The situation of other banks was equally hopeless – on the 1st of April 2008 UBS announced a $10 billion write off, less than three weeks later Citigroup wrote down $15.2 billion of assets, and on the 16th of June Lehman Brothers announced a net loss of $2.8 billion for the second quarter alone.

By 2008 Fannie Mae and Freddie Mac had $5.5 trillion worth of asset backed securities on their balance sheet – both GSEs suffered losses on such a scale that the U.S. government had to step in on the 7th of September and take the two firms into conservatorship.

A week later another investment bank, Merrill Lynch, was taken over by the Bank of America, and the following day, on the 15th of September, Lehman Brothers filed for bankruptcy. The situation became even more difficult when the American International Group, the largest counterparty in the credit default swaps market, with obligations to only its five biggest institutional clients worth almost $30 billion, had to accept emergency financial aid from the government amounting to $85 billion in exchange for 79.9% ownership stake on the 16th of September, just a day after the fall of Lehman Brothers (Buckley, 2011).

The examples mentioned above were only the tip of the iceberg, as practically every single important financial institution in the world witnessed the value of its ‘safe’ assets decreasing so rapidly that raising the necessary capital to offset their losses was close to impossible. One of the Federal Reserve’s stress tests carried out on the sample of the largest investment banks in the United States estimated that the losses they would incur between 2009 and 2010 would amount to more than $600 billion, with further $185 billion required to maintain their minimum capital ratios (Federal Reserve, 2009).

Table 1 presents the percentage change between the 1st of January 2007 and the 31st of March 2009 of the stock market capitalisations of the banking systems in various
countries, and portrays the scale of losses incurred by the financial sector in such a short time.

Table 1: The effects of the crisis on market capitalisation of the banking system

<table>
<thead>
<tr>
<th>Country</th>
<th>1 January 2007 ($ billions)</th>
<th>31 March 2009 ($ billions)</th>
<th>Percentage change</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>1560.5</td>
<td>352.1</td>
<td>-77.44%</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>714.4</td>
<td>163.3</td>
<td>-77.14%</td>
</tr>
<tr>
<td>Japan</td>
<td>651.3</td>
<td>248.8</td>
<td>-61.80%</td>
</tr>
<tr>
<td>China</td>
<td>667.4</td>
<td>525.3</td>
<td>-21.29%</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>345.8</td>
<td>131.5</td>
<td>-61.97%</td>
</tr>
<tr>
<td>Germany</td>
<td>151.6</td>
<td>37.0</td>
<td>-75.59%</td>
</tr>
<tr>
<td>France</td>
<td>372.8</td>
<td>97.8</td>
<td>-73.77%</td>
</tr>
<tr>
<td>Italy</td>
<td>338.1</td>
<td>99.3</td>
<td>-70.63%</td>
</tr>
<tr>
<td>Poland</td>
<td>51.2</td>
<td>20.2</td>
<td>-60.55%</td>
</tr>
<tr>
<td>Russia</td>
<td>126.0</td>
<td>23.9</td>
<td>-81.03%</td>
</tr>
</tbody>
</table>

In order to contain the rapidly spreading crisis, the governments all around the world had to introduce emergency funding and relief programmes aimed at counteracting the consequences of the widespread exposure to exceptional credit losses on portfolios of toxic assets – in the United States the rescue packages amounted to $2,684 billion, in the United Kingdom to $1,476 billion, and to $2,622 in the Eurozone (Buckley, 2011). With some of those costs amounting even to 244% of GDP in the extreme case of Ireland, containing the first stage of the Global Financial Crisis was no reason for celebration, as a long and painful recession with yet another crisis bound to happen was looming just around the corner.

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5 Pilbeam, K. (2010), p. 428; Source: Financial Times
Chapter II
Pre-crisis Economic Policy

The previous Chapter focused primarily on the immediate causes of the Global Financial Crisis and the recession that followed, identifying the originate-to-distribute lending model and the actions of the Government Sponsored Entities as the main drivers fuelling the excessive lending in the United States, and the wide-spread leveraged speculation on asset-backed securities as the main issue leading to the collapse of the financial markets in mid-2007. The analysis presented in this chapter investigates the economic policy followed in the years leading up to the Crisis, in order to establish the extent of the role it played in creating the imbalanced economic environment in which a disaster of such a magnitude could have occurred.

In their paper, Barnett and Chauvet (2008) presented an argument that the Global Financial Crisis brought an end to the Great Moderation – an episode in the history of the economic development of the Western world characterised primarily by a very low volatility of the business cycle, frequently viewed as a direct result of developments and improvements in monetary policy. The magnitude of the decline in the volatility of the business cycle was very significant, as it decreased by a factor of three over the period of the Great Moderation, due to smarter countercyclical economic policy, and to lower output and inflation volatility that occurred around the same time, both associated with better monetary policy (Blanchard and Simon, 2001). Another possible explanation for this sharp decrease in volatility was presented by McConnell and Perez-Quiros (2000), who argued that it was driven primarily by a reduction of volatility in the durables production, which also corresponds to a drop in durables output in favour of inventory investment, possibly suggesting a shift from goods production to services.

Figures 7 and 8 provide an overview of the post-Second World War real gross domestic product growth rates in the United States, and in the United Kingdom respectively, with the period of the Great Moderation reflected by the shaded areas of the two charts. Indeed, as suggested above, some time around the early 1980s, the
pattern of the behaviour of the data changed significantly, as the amplitude of the business cycle fell dramatically.

Figure 7: The Great Moderation - Evidence from the United States

Figure 8: The Great Moderation - Evidence from the United Kingdom
Interestingly enough, in her paper Romer (1986) provides evidence that suggests that the Great Moderation never really occurred and that it can be associated with a data error. Having identified the sources of the inconsistency between the historical and the modern economic data collection methods, in particular data on industrial production, unemployment, and gross national product, Romer analysed the post-war data using the older methodology and found that there was no significant reduction in the volatility of cyclical fluctuations of economic growth.

Although Romer’s (1986) findings provide a solid foundation for a greater dose of scepticism, business press and the majority of economists called the Great Moderation a triumph of modern macroeconomics. Blanchard and Simon (2001) concluded their paper with a rather remarkable statement that one could be confident about the steadiness and permanence of the increased periods of economic expansions, implying a much lower likelihood of recessions. Furthermore, Lucas (2003) went as far as to suggest that the central problem of macroeconomics, prevention of depressions, had been solved for all practical purposes. The boom and the bust cycle was supposed to be finally dead, with a new era of growing wealth and prosperity awaiting ahead.

This spirit of optimism about the future was also present in the stock market. Figure 9 provides an overview of the changes in the values of Dow Jones Industrial Average market index since the 31st of January 1980. In the three decades leading up to the Financial Crisis, the index grew in value from 875.75 points on the 31st of January 1980 to 14,164.53 points on the 9th of October 2007, an increase by a factor of more than sixteen. The following example makes it much easier to appreciate how significant and rapid this change was: the growth of the value of the index that occurred between January 1918 and May 1985 was an increase by a factor of the same value too. Figure 10 provides graphical representation of the changes discussed above.

The natural question to ask at this point of the analysis is what exactly were the changes in economic policy that had such a tremendous impact on the macroeconomic environment.
Figure 9: Dow Jones Industrial Average and the Great Moderation

Figure 10: Dow Jones Industrial Average 1918 - 2013
As pointed out earlier, academics generally accept the fact that it was the improvement of monetary policy and its tools that ultimately created the environment in which the volatility of business cycle could have been dampened.

Summers (2005) points out that the most significant development associated with monetary policy was the decision to make controlling the inflation a central bank’s top priority. Low and stable inflation generally contributes to a more stable economic environment, as firms’ uncertainties about the future are reduced, and so are nominal distortions associated with taxation, and finally low and stable expected inflation provides policy makers with much more flexibility in responding to unforeseen events such as banking crises (Summers, 2005).

Figure 11 portrays the levels of inflation rates in the United States and in the United Kingdom, and shows that throughout the majority of the covered period they did in fact remain low and fairly stable.

The new monetary policy framework adopted in early 1980’s is broadly known as conventional monetary policy. As Joyce, et al. (2012), explain, it was based on inflation targeting, a policy aimed at achieving low and stable inflation by changing the short-term interest rate at which central banks provide money to the interbank money market in a manner that can be approximated by Taylor Rule.
With the changes in the rate of inflation associated primarily with the extent of the output gap, that is the difference between the current and the equilibrium level of output, under this new monetary regime, a central bank would raise its official rate of interest when inflation was predicted to increase above a fixed target level, and would lower the interest rate if inflation rate fell below the target - all of the aforementioned variables are incorporated into Taylor Rule, which in practical terms underpinned the interest rate setting framework of monetary authorities (Goodhart, 2010).

Michael Woodford’s *opus magnum*, “Interest and Prices: Foundations of a Theory of Monetary Policy” (2003), provides a very detailed theoretical framework upon which conventional monetary policy was based, however, given the thoroughness of his work, a detailed discussion of his contribution would go far beyond the scope of this dissertation, and therefore it is only briefly summarised in this chapter.

Following the collapse of the Bretton Woods system of fixed exchange rates, the value of money stopped being connected to any real commodity, creating a system of fiat money, with its value depending only on the policies adopted by monetary authorities (Woodford, 2003). To achieve greater macroeconomic stability, central banks have committed themselves to explicit objectives concerning inflation, which increased their ability to control it and brought increased price stability, providing a strong foundation for economic growth (*ibid.*). Furthermore, by making their policies more reliable and understandable for the private sector, abandoning the more discretionary *ad hoc* system in favour of a more systematic and rule-based approach, monetary authorities contribute to an increasing stability of the general economy (*ibid.*).

Essentially, as explained above, Woodford (2003) presents a model in which the monetary authorities can set their official nominal interest rate by standing ready to lend and to borrow at their policy rate, allowing the quantity of money in the system to be adjusted by arbitrage, rather than by using any specific quantity targets. His work puts a particular emphasis on the fact that the policy adopted by a central bank should be robust enough to prevail over a wide variety of random shocks to the economy, rather than rely on models that consider only one type of shocks more significant in importance than others (*ibid.*).
The statement above, however, suffers from one fallacy, identified by Green (2005) – Woodford’s theory considers credibility and commitment the two probably most important features of conventional monetary policy but fails to offer a solution to the problem of dealing with policies that may generate some desirable immediate effects, yet may prove to be either unfeasible or harmful in the long-run. Nonetheless, he still argues that Woodford’s work can be regarded “a bible for central bank economists” (Green, 2005: p. 121), as it offers a theoretical framework that is robust enough to derive an optimal policy matching a wide range of preferences and opinions displayed by central bankers, such as in the case of differing views on defining stability in terms of price level or in terms of inflation rate (Green, 2005).

The theory presented by Woodford (2003) overcomes a number of issues associated with the previous system developed under neoclassical synthesis theoretical framework, which assumes that the economy is Keynesian in the short-run and classical in the long-run (Farmer, 2012), most importantly, it explains that stabilisation policy, previously deemed ineffective due to the fact that shocks to demand were assumed to be less significant in their importance than supply and technology shocks, can be successful in suppressing the business cycle while also providing additional welfare benefits (Green, 2005).

Despite its theoretical elegance and simplicity, and success in achieving low inflation, as pointed out by Joyce, et al. (2012), conventional monetary policy suffers from one significant setback – it does not prevent asset market bubbles from occurring, and while it is true that it is difficult to identify and contain an asset bubble ex ante, the soundness of the policy to allow a bubble to burst and then contain its negative effects rather than to attempt suppressing its development remains highly questionable.

During a dinner speech on the 5th of December 1996 Alan Greenspan, then the chairman of the Federal Reserve, famously said that, “We as central bankers need not be concerned if a collapsing financial asset bubble does not threaten to impair the real economy, its production, jobs, and price stability” (Shiller, 2005).

Goodhart (2010) points out to the fact that conventional monetary policy led to a popular assumption that as long as central banks maintain macroeconomic stability, the efficient financial markets will ensure financial stability, however, as pointed out by Minsky (2008), more frequently the former may have inverse effects on the latter,
as overconfidence in periods of stability may provide additional incentives to take on more leverage and risk.

Although as mentioned before, identifying asset bubbles *ex ante* may be extremely difficult, they all share certain significant characteristics that are usually identified after their deflation: during their expansionary phase, markets in which an asset price bubble is developing are increasingly popular not only with the market participants but also with politicians who tend to attribute the rise in asset prices to the success of their own policies (Goodhart, 2010; Kaplan, *et al.*, 2009).

As explained by Goodhart (2010), the main problem with asset bubbles is that even if the monetary authorities feel that some asset prices are too high, increasing interest rates is far more likely to depress the real economy than to have any significant effect on the bubble itself, and that a successful intervention, although very unlikely to happen, would probably raise voices of criticism stating that perhaps the bubble was not that dangerous after all.

Although asset bubbles usually end up badly, they also generate some wealth – Siegel (2009) argues that allowing bubbles to inflate provides certain gains in wealth, as the more available funding for new business ventures, even though the vast majority of them typically fail during the deflation stage, allows for funding of new technologies and other innovations that benefit the whole society.

The analysis presented above can now be related to the main topic of this dissertation, the Global Financial Crisis. Figure 12 portrays the levels of the official nominal interest rate and the real interest rate (calculated as the official interest rate minus actual inflation rate) in the United States.

On the 10th of March 2000, NASDAQ Composite stock market index tracing the performance of technological companies closed at a historical high level of 5,048.62 points. That day marked the beginning of the rapid deflation of the dot-com bubble, which lasted until the 10th of October 2002 when it closed at a level of 1,108.49 points. The deflation of the bubble, combined with the impact of the economic uncertainties that followed the Asian Crisis of 1997, was pushing the United States into a recession.
The reaction of the Federal Reserve to the worsening economic conditions was largely consistent with the framework of conventional monetary policy – increasing the interest rate when the economy is in a boom period and risks overheating, and decreasing it, that is applying easy money policy, when there is a real possibility of a recession (Siegel, 2009).

As presented in Figure 12, the Federal Reserve increased its official nominal interest rate in the run up to the deflation of the dot-com bubble, trying to minimalize the effects that its burst might have on the overall economy (preparing it for a soft landing), and then, to stimulate recovery and growth, it switched from the tight to easy money policy, lowering the interest rate from 6.5% to 1%.

The actions of the Federal Reserve had two profound effects: first of all, lowering interest rates and flooding market with liquidity allowed to curb the ongoing recession, which lasted only eight months, from March to November 2001; second, and more importantly, by keeping the official interest rate at 1% until April 2004, almost three years after the end of the 2001 recession, the Federal Reserve made a significant contribution to the excessive growth of the mortgage market and to the formation of another asset bubble, the housing market bubble.
Goodhart (2010) states that central bankers tend to be very sensitive about the fact that, at least in the past, their solution to a market crash was to cut interest rates aggressively and persistently, thus encouraging a formation of a new asset bubble. This strategy of adopting easy money policy as a response to a financial crash, in order to prevent a recession or freezing up of a market, was also used in October 1987 in the wake of an unprecedented one-day 22% decline of the U.S. stock market with no threat of a subsequent recession or further turmoil (Siegel, 2009).

In his paper, Siegel (2009) quotes the example of the infamous Gordon Gekko, a rogue trader depicted in the 1987 film “Wall Street”, who used to say that greed is good. He argues that out of all private vices, it is greed that makes the engine of the economy hum, as people acting in their own interest, rather than pretending to act in someone else’s, are encouraged more to channel their own vices to produce some benefits, however, at the same time he points out that this process fails once its participants begin to think that they are protected in one way or another from the negative consequences that might arise while still being allowed to keep their reward (Siegel, 2009).

The argument goes even further suggesting that the whole economic system established after the conclusion of the Second World War provided a widespread misperception about the responsibility and the ability of the government to foster economic growth, occasionally intervening to counteract a recession. Siegel (2009) explains this statement using four examples of government intervention policies, two of which were already discussed in this chapter, i.e. the ability of the government to foster the Great Moderation by skilful manipulation of the money supply, and its ability to counteract the painful consequences of an asset market crash by flooding it with liquidity.

The other two examples are those of the Great Depression, and the Great Inflation. Friedman and Schwartz (1963) pointed out that the Federal Reserve bears a significant proportion of the blame for turning the Black Tuesday Wall Street Crash of October 1929 into the Great Depression by severely restricting the money supply between 1929 and 1933, pursuing a policy of cripplinga tight money in the time of collapsing real output. An extensive programme of Keynesian deficit spending
policies, introduced by the Hoover and the Roosevelt administrations, as part of the
New Deal came to the rescue of the economy (even though economic historians agree
that the New Deal might have worsened the Depression, and it was the Second World
War that brought the United States out of it), and so, many people believe that if the
government managed to get the economy out of the Great Depression through fiscal
stimulation, it is capable of fixing any other significant economic problem (Siegel,
2009).
As far as the Great Inflation is concerned, it was caused primarily by an oil embargo
imposed on the United States by the Organisation of Arab Petroleum Exporting
Countries in 1973. With oil being an input to the U.S. economy of such a crucial
importance that a significant increase in its price would push it into a deep recession,
the Federal Reserve decided to rapidly expand the money supply to avoid it, which
resulted in inflation rates reaching 13.3% (Siegel, 2009). The Great Inflation came to
an end with the appointment of Paul Volcker as the chairman of the Federal Reserve –
although it pushed the economy into a recession in 1979 and another one in 1981 –
1982, his decision to sharply increase the interest rates brought the inflation down to
the manageable level of 3.9% (ibid.). Once again, modern macroeconomic policy
proved that it is capable of dealing with yet another threat to the stability of the whole
economy.
To summarise, the misguided lesson that seems to have been learnt from the four
aforementioned events is that the government has the ability and the means to solve
almost any economic problem through either fiscal or monetary intervention (Siegel,
2009).

Kaplan, et al. (2009) pointed out that greed and misaligned incentives, so typical of
human nature, lie at the heart of all asset bubbles. The erroneous perception of the
disappearance of fundamental macroeconomic risk factors associated with business
cycle fluctuations and inflationary threats, as well as the financial innovations
designed to reduce risk were, rather ironically, the means by which the risk of the
occurrence of an event as disastrous as the Global Financial Crisis was greatly
magnified (ibid.).
Chapter III

Post-crisis Macroeconomic Environment

So far, the analysis presented in this dissertation focused primarily on the causes of the Global Financial Crisis, with the more immediate issues of a more financial nature discussed in Chapter I, and its macroeconomic roots that contributed to the creation of an imbalanced economic environment analysed in Chapter II. The discussion presented in this chapter offers insights into the characteristics of the current post-crash macroeconomic situation, which renders many of the conventional policy tools ineffective, contributing to the ongoing weak and fragile recovery.

Before it discusses the aforementioned issue, however, the analysis will offer some insights into the debate that immediately followed the Crisis, which questioned the validity of the Efficient Market Hypothesis, and the rationale behind the economic pretence of knowledge syndrome.

Throughout his book, Stiglitz (2010) actively criticises the view that the markets are efficient and self-correcting, quoting many examples of their inefficiency that he observed in the years leading up to and directly following the Global Financial Crisis. Davies (2010) takes a similar position blaming the supposedly flawed Efficient Market Hypothesis for the discrepancy between asset prices and economic fundamentals, and even criticising business schools for their emphasis on short-term returns and neglecting of ethical principles.

Zingales (2010), on the other hand, presents an argument which the author of this dissertation finds much more well-balanced and easy to agree with. His paper argues that the most recent market crash is much easier to explain in terms of the Efficient Market Hypothesis than, for example, the October 1987 crash, when the market dropped 22.6% in just one day with no major news or signs which could signal its imminent collapse (Zingales, 2010).

The starting point of his argument is the one developed by Friedman, stating that when there is a discrepancy between asset prices and their fundamental values, a rational investor can profit by selling the overvalued one and buying the undervalued one, with the very act of arbitrage trading pushing both prices towards
equilibrium (Friedman, 1953). Zingales (2010) argues that the participants in the housing market, however, are not smart investors trying to make the best use of the discrepancy between prices and fundamentals described by Friedman, and that there is a very high cost of arbitrage in this particular market. Nonetheless, despite the fact that the asset-backed securities based on mortgages issued to the riskiest group of borrowers were still considered safe, which with the benefit of hindsight seems rather irrational, they were still priced correctly, which provides evidence that although they were not perfect, markets remained efficient (ibid.).

Although it is fair to say that with irrational exuberance and lack of capital for smart arbitrageurs, the Efficient Market Hypothesis is not strictly true, it still serves as a sufficiently close approximation of the reality – what the Global Financial Crisis really changed in terms of the Hypothesis, is the academic appreciation of how costly the violations of the Hypothesis can be, particularly with significant leverage involved (ibid.).

Stiglitz (2010) and Davies (2010) use one more argument against the theory of market efficiency, pointing out the fallacy that the supporters of the market efficiency theory exhibit by criticising the deflationary intervention of the Federal Reserve in the markets, as, in their view, markets are currently unable to correct themselves. Zingales (2010), however, provides a counterargument, in which he explains that the supporters of Efficient Market Hypothesis do not in fact claim that the market always gets it right and is able to correct itself, but that the cost of deviation from the efficient state is incomparably lower than the cost imposed by a misguided interventionist policy.

In essence then, the Global Financial Crisis cannot serve as an example of a fallacy of the Efficient Market Hypothesis, but remains as a painful example of the potential costs that deviations of asset prices from their fundamental values can have on the real economy.

The phrase “pretence of knowledge” was coined by F.A. von Hayek, and was used as the overarching idea in his Nobel-prize acceptance lecture:

“Of course, compared with the precise predictions we have learnt to expect in the physical sciences, this sort of mere pattern predictions is a second best with which one does not like to have to be content. Yet the danger of which I want to warn is
precisely the belief that in order to have a claim be accepted as scientific it is necessary to achieve more. This way lies charlatanism and worse. To act on the belief that we possess the knowledge and the power which enable us to shape the process of society entirely to our liking, knowledge which in fact we do not possess, is likely to make us do much harm” (Hayek, 1989: p. 7).

This statement seems to be particularly applicable in the post-Crisis situation in which we currently are. After all, as mentioned in Chapter II, many prominent macroeconomist shared the seemingly justified belief that the long and stable growth associated with the Great Moderation would carry on in the foreseeable future with a minimal risk of recessions, which modern macroeconomic policy tools were supposed to prevent so well.

Caballero (2010) argues that, taking into account that the ultimate goal of macroeconomics is to explain and model the aggregate outcomes stemming from the decisions of multiple economic agents interacting through a number of complex markets, addressing this extremely ambitious goal in an adequate manner, preferably displaying microeconomic-theory-like precision, is incredibly difficult. One approach to the problem is to abandon the attempts to formalise economic theories in mathematical terms incapable of capturing the complexity of the world they try to explain, whereas the other, one that modern macroeconomics seem to prefer, is to develop a number of methods allowing to portray a precise yet irrelevant world in a highly quantitative manner (Caballero, 2010).

The problem with designing an effective macroeconomic policy tool, however, is that by their very nature, crises are unpredictable, for otherwise they would not be capable of causing such a high degree of instability and turmoil, and for this reason, the probability of designing a policy capable of offering more than some common-sense procedures is rather low (ibid.).

To conclude, it is probably fair to say that the pre-Crisis macroeconomics framework displayed highly developed syndromes of Hayekian pretence of knowledge, however, one should hope that the lessons we have learnt from the Crisis will help us realise how little we really know, which in turn will stimulate our desire for better and more accurate theories.
In its latest “Economic Outlook” the Organisation for Economic Cooperation and Development (2012) summarised the current macroeconomic situation emphasising the following facts:

1. Recovery is projected to be hesitant and uneven over the next two years, with the European Monetary Union remaining in close-to-recession conditions for the foreseeable future;
2. Given the weak economic outlook, accommodative monetary policy is still required, with further easing necessary in the European Monetary Union;
3. Fiscal consolidation is necessary in many countries but, given high fiscal multipliers at the moment, excessive austerity might prove to be very costly;
4. Lower interest rates, further quantitative easing, and additional policy support will be necessary should serious downside risk materialise;
5. The crisis in the European Monetary Union remains the greatest threat to the global economic recovery, in spite of the recent policy adjustments that have resolved its immediate problems – much more still remains to be done to ensure long-term stability.

Because of the complexity and the breadth of the issues identified above, a very detailed and insightful analysis would require far more attention and research than the scope of this dissertation is capable of offering, even though it would provide an overarching perspective on the whole cause and effect chain of the events set in motion by the inflation of the asset bubble in the American housing market. For this reason, the discussion presented in this chapter will focus primarily on providing an overview of the changes in fiscal and monetary environment that forced the policy makers to abandon their traditional macroeconomic tools.

Barrell and Holland (2010) provide a very concise, yet accurate explanation of the main source of the current extremely difficult monetary and fiscal environment – as the liquidity crisis in the banking sector grew in scale to the extent that it finally transformed into a large-scale solvency crisis, it became increasingly clear that the central banks would not be able to act as the lender of last resort, due to their inability to lower their official interest rates any further. That meant that the government would have to step in, increasing its budget deficit in order to provide emergency funding for the banking system. Furthermore, as pointed out by Reinhart and Rogoff (2009a), the
inevitable collapse of tax revenues that the governments suffer from in the wake of deep and prolonged crises, and the ambitious countercyclical fiscal policies that they have adopted, were the additional drivers of increasing national debts.

The first step in the analysis of the post-Crisis macroeconomic environment presented in this chapter is the analysis of the monetary environment in which conventional monetary policy, described in the previous chapter, is rendered ineffective.

A good starting point of the discussion is the IS – LM model developed as a mathematical formulation of the ideas presented by John Maynard Keynes (1973) in “General Theory of Employment, Interest, and Money”.

The IS (Investment and Saving) side of the model captures the effects of changes in interest rates on aggregate demand, whereas the LM (Liquidity preference and Money supply) depicts the equilibrium in the money market for a given level of money supply (Begg, et al., 2008). The model was formulated primarily by John R. Hicks in 1936, and is based upon the following set of equations:

\[
\begin{align*}
\text{IS:} & \quad Y = C(Y - T) + I(r) + G;
\text{LM:} & \quad \frac{M}{P} = L(r, Y)
\end{align*}
\]

where: \(Y\) – income/output, \(C\) – consumption, \(T\) – taxes, \(I\) – investment, \(G\) – government spending, \(M\) – money supply, \(P\) – price level, \(L\) – liquidity preference, \(r\) – interest rate.

As lower interest rates increase both aggregate demand and output, the IS schedule line has a negative slope – changes in the rate of interest cause movements along the IS line, whereas any other changes in aggregate demand shift the line in one direction or another (ibid.). Figure 13 provides a graphical representation of the IS schedule.

As far as the LM schedule is concerned, it has a positive slope, as, given that money supply is assumed to be fixed, only an increase in interest rates can counteract the effects of greater quantity of money demanded resulting from higher income, bringing the money market back to equilibrium state (ibid.). Figure 14 below depicts the LM schedule.
With the two halves of the model combined, the IS–LM model becomes a general equilibrium model depicting the equilibrium interest rate \( r^* \) that brings both the goods
market and the money market into equilibrium, resulting in the equilibrium level of income $Y^*$ (ibid.). The complete $IS - LM$ model is portrayed in Figure 15 below.

![Figure 15: General Equilibrium in the IS - LM Model](image)

As indicated in Chapter II, the neoclassical synthesis theoretical framework assumes that the economy is Keynesian in short-term and classical in the long-term (Farmer, 2012), therefore applying the $IS - LM$ model to analyse some of the ongoing macroeconomic problems might prove particularly helpful.

One particular problem exhibited by the model was described by one of its authors, merely a year after it was finally formulated – Hicks (1937) noticed that under severe economic distress conditions, the $LM$ schedule line will become flatter near its left-hand end, which means that shifting it by increasing the quantity of money supplied will have no effect on equilibrium interest rate and income, as shown in Figure 16.
This particular problem is known as the liquidity trap – the fact that, in words of Hicks, turns the “‘General Theory of Employment’ into Economics of Depression” (Hicks, 1937: p. 155), as monetary policy becomes completely ineffective. Krugman (2000) explains the problem using a simple example – if we assume that bonds and money are effectively assets that can be considered perfect substitutes, which they become if interest rates are very close to zero, then conventional monetary policy, in which bonds are swapped for money in open-market operations, does not change anything.

Although monetary authorities can no longer employ the conventional policy tools in liquidity trap conditions, they can still opt for a policy which has the potential to solve the problem – a credible commitment to achieving inflation rates higher than the target-rate under normal economic conditions, which will lower the real interest rate and stimulate the economy out of liquidity trap despite the nominal interest rate remaining at a near-zero level (Jeanne and Svenson, 2007). The problem, however, is that making a credible commitment to higher future inflation rates may be difficult to achieve, as investors may expect the central bank to change its policy target rate back

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6 Figures 13 – 16 used to explain the IS – LM model are author’s own work.
to the initial one once economic conditions improve (*ibid.*). To overcome this problem, Jeanne and Svenson (2007) recommend a strategy of central bank’s capital management, in which capital levels are reduced to the minimum that would be consistent with a future exchange rate associated with the desired higher inflation rate, thus providing a more credible commitment to increasing inflation. This approach, however, has been criticised by Sims (2004) for minimising the central bank’s potential to avoid a self-fulfilling hyperinflation threat.

In the midst of the Crisis, the lending in the interbank markets as well as lending to consumers came to a sudden halt, as banks began accumulating cash on their balance sheets having they lost their confidence about the future, pushing the economy into a liquidity trap (Skidelsky, 2011).

The countercyclical monetary policy, described in more detail in the previous chapter, relied heavily on its ability to flood the market with liquidity in times of financial crises and recessions in order to first stabilise it and then stimulate economic recovery and growth, however, having sharply lowered the official nominal interest rate from 5.25% in 2007 to 0.25% in late 2008 in the United States, and from 5.75% in 2007 to 0.5% in mid-2009 in the United Kingdom, to little or no real effect, the monetary authorities found themselves in a situation, whereby they were simply unable to stimulate the economy any more, due to the fact that the official interest rates could not be decreased any further (Buckley, 2011). Conventional monetary policy had to be abandoned – credit easing and quantitative easing, the unconventional monetary policies that replaced it, are described in much more detail in Chapter V.

The Austrian School of Economics, on the other hand, provides an alternative explanation of the lack of any significant impact on output that monetary policy displays under near-depression conditions. Mises (1996) suggests that artificially induced periods of economic boom encourage overconsumption and malinvestment, which leads to a misallocation of the scarce factors of production with a simultaneous reduction of available stocks. In his view, a recession, or in the worst-case scenario, a depression always follows an economic boom, so consumption can return to its natural state, and factors of production can be reallocated back to the industries which use them the most efficiently (Mises, 1996). In essence, economic downturn brings about forced saving and forced liquidations, which ultimately restore the initial
economic balance (Garrison, 2004). Mises (1996) points out, however, that a government intervention aimed at aiding the failing industries, which benefited from the malinvestment the most, will only prolong the period of economic downturn, as it protects them from liquidation, thus not enabling the market to return to its equilibrium state while enforcing the cost of this prolonged agony on the taxpayers.

This line of thought suggests that lowering interest when economic growth slows down results only in allowing the firms that are bound to fail, as the market attempts to correct malinvestments, to avoid liquidation for much longer than necessary – ultimately, by lowering its official interest rate as much as it can, a central bank prevents the market forces from restoring the balance, creating liquidity-trap-like conditions, in which it cannot conduct its conventional policy anymore, while the economy still remains in recession.

Having established that the monetary authorities, facing a liquidity trap, had to abandon their typical tools and policies in favour of unconventional policy, the analysis will now focus on fiscal policy. As mentioned before, due to collapsing tax revenues and substantial countercyclical programmes, governments of the countries most affected by the Global Financial Crisis have been facing increasing levels of debt. Skidelsky (2011) points out that as the Crisis deepened, governments intervened in almost every single market with various forms of stimulus packages including bailouts, tax rebates, printing money, subsidies for private businesses, and other forms of debt-financed public spending, which most economists and policy-makers are calling for withdrawal from, as they fear that carrying on with this policy may lead to governments going bankrupt, high inflation, or both.

As a result of the Crisis the gross government debt levels have increased by 30 percentage points between 2007 and 2011 in advanced economies, reaching 103% of GDP in the United States, 230% of GDP in Japan, 83% of GDP in the United Kingdom, and 88% of GDP in the European Monetary Union (Bussiere, 2013).

Figure 17 portrays the rising levels of indebtedness of several European countries between 2000 and 2011, and provides a graphical representation of the direness of their fiscal situation.
Ghosh, et al. (2013) point out that the currently observed public deficits and primary balances of the advanced economies have reached their highest levels in the last 40 years, and furthermore, that the sharp increases of their borrowing costs, from essentially risk-free rates to the levels considered prohibitively costly implying an increasing risk of possible insolvency, should serve as a warning sign to other countries at risk of exhausting their fiscal space.

Typically, a responsible government increases its primary surplus in response to rising debt service in order to maintain a constant debt-to-GDP ratio at a reasonable level, however, a large economic shock, for example a war or a financial crisis, may force it to temporarily abandon the aforementioned policy, only to increase the primary surplus again in the future to offset the higher interest bill (*ibid*.).

Increasing the primary balance enough to offset the interest bill, however, may not be possible under certain circumstances, as at sufficiently large levels of debt, the primary balance would have to exceed the gross domestic product – if the primary balance displays fiscal fatigue, that is it fails to keep up with the increasing debt service, there is the possibility that the government will have to default having reached sufficiently high debt level (*ibid*.). The main problem is that the risk premium
a government has to pay on its debt increases together with its indebtedness, so after reaching a certain level of debt, the risk of government default becomes self-propelling, as higher levels of debt imply higher risk premium, which in turn increases the borrowing costs leading to even higher levels of debt, etc. (ibid.). Once a government finds itself in this loop, as suggested by Arellano (2008) and Mendoza and Yue (2012), it faces a decision of whether or not to default, which is ultimately based upon the balance of gains resulting from avoiding at least a proportion of its debt service obligations, against the costs of output losses and restricted access or even exclusion from international credit markets.

With the increasing risk of exhausting their fiscal space, understood as the scope that policy-makers have to calibrate fiscal policy without facing the risk of reaching unsustainable debt levels (IMF, 2012), governments had to adopt austerity measures and consolidation efforts aimed at bringing their debt-to-GDP ratios back to manageable levels, particularly given the pressure from the financial markets reacting particularly badly to even the slightest hint that yet another country might be facing insolvency.

The most significant problem with fiscal consolidations centres around their duration, composition, that is whether they are spending or tax based, and the public’s expectations of their composition (Bi et al., (2013)). Research suggests that when people anticipate tax increases used as one of the imminent austerity measures, they will suffer from higher inflation and higher debt service costs, even if the consolidation programme turns out to be spending based (ibid.). Moreover, the perception of undesirable fiscal consolidation may have a negative impact on overall economic activity, as distortionary taxation may increase marginal costs and fuel inflation, whereas substantial spending cuts implemented too quickly and too extensively may lead to increasing deflationary pressures (ibid.). Interestingly enough, Bilbiie et al. (2013) report that debt financed tax cuts may have a rather paradoxical consequence: due to redistribution effects shifting wealth from savers to borrowers when a tax cut is implemented, followed by another redistribution in the opposite direction when taxes are increased in the future in order to repay the debt, borrowers have the incentive to work less, whereas savers, to work more, which ultimately leads to an overall contraction in spending and output – essentially, a tax
cut today may result in economic contraction, and a tax increase in the future may lead to economic expansion, primarily because debt-financed tax cuts increase the aggregate spending of borrowing-constrained agents who will be forced to consume less once the economy reaches its steady-state and taxes are increased.

It is also worth mentioning the findings presented by Corsetti, et al. (2013), who reported that pessimistic expectations about the future, regardless of whether they are related to any fundamentals, cause upward revisions of deficits, increasing risk premiums, which in turn increase private borrowing costs, ultimately contributing to a deceleration of economic activity. This self-fulfilling expectation is particularly apparent when the risk of sovereign default is very high and the monetary policy is constrained, as monetary authorities cannot lower the official interest rate to counteract the expected negative developments (ibid.).

As reported by the International Monetary Fund (2012), the deficits of advanced economies decreased by one percentage point in 2012, although countries with more fiscal space, like Germany and Canada, should consider slowing the pace of their consolidation programmes to avoid excess fiscal contraction that has the potential to further deteriorate the current economic conditions – this short-term caution, however, should not serve as an excuse to limit the efforts to put the public finances in order, which remains a key requirement for a more sustainable economic growth in the future. The importance of fiscal tightening programmes becomes particularly apparent when the fact that central banks currently hold large amounts of government debt and other assets, which will have to be liquidated or rolled over to the private sector one day in order to bring the monetary base back to its original state, is taken into account (ibid.).

The debt levels are expected to stabilise by 2015, however, due to delayed effects that fiscal policy has on the real economy the importance of communicating government strategies to general public in order to fuel confidence and credibility of its actions cannot be overemphasised (ibid.).

The discussion presented above indicates how difficult designing an effective fiscal policy is under conditions rendered by the current macroeconomic environment. Taking into account that monetary policy is significantly constrained by effectively reaching the zero lower bound on interest rates, managing expectations of the public
becomes really important. Implementing a fiscal consolidation programme that is too severe or attempts to reduce the debt-to-GDP ratio too quickly may have adverse effects on expected economic growth. A programme that is not extensive enough, on the other hand, may result in increased borrowing and debt service costs that can further hinder the already weak economic recovery. There is a fine balance between the two approaches and the governments of the advanced economies affected by the Crisis the most face a very difficult task of getting it right in the early stages of implementing fiscal tightening measures.
Chapter IV
The Unique Experience of Japan

Despite having led the global economic growth in the 1960’s and the 1970’s, maintaining a very strong position during the 1980’s, the Japanese economy has remained in an economic stagnation ever since (Tyers, 2012). The Japanese financial crisis that began in 1992 bears a striking resemblance to the Global Financial Crisis, both as far as its causes and the responses of the policy-makers are concerned (Reinhart and Rogoff, 2009b) – with the Japanese experience of two “lost decades”, it is definitely worth taking a closer look at the origins and the consequences of the problem, as the benefit of hindsight might provide some valuable lessons that will allow not repeating the same mistakes and facing similar prospects of the future.

The analysis begins with providing a brief overlook of the Japanese economy over the last thirty years, setting the stage for further discussion presented in this chapter. Figures 18 – 20 depict the changes in growth rates of the Japanese gross domestic product, the changes in the official nominal rate of interest of the Bank of Japan, and the changes in the value of the main Japanese stock market index, Nikkei 225.

![Gross Domestic Product Growth in Japan 1980 - 2012](image)
There a number of issues that become immediately apparent after taking a closer look at the data depicted in Figures 18 – 20. First of all, as mentioned in the introduction to
this chapter, the strong pattern of relatively economic growth rates changed in the early 1990’s, deteriorating significantly. Second, the monetary policy pursued by the Bank of Japan seems to closely resemble the pattern displayed by the interest rate decisions of the Federal Reserve portrayed in Figure 12 in Chapter II, as the Japanese interest rates were increased in the run up to the market crash, and then sharply decreased, almost to zero in the aftermath. Interestingly enough, the apparent lack of data for the period between early 2001 and early 2006 is not a result of a printing error but a reflection of the fact that the Bank of Japan did not quote official interest rate at all in that period. Finally, the Japanese stock market has never recovered from the crisis, as the recent value of the Nikkei 225 Index is only 30% higher than the one recorded in early 1980, which compared to the value it reached in the early 1990’s, an increase by the factor of six in just ten years, is a fairly disappointing performance.

The academic debate that followed the meltdown of the Japanese economy, reinvigorated by the more recent developments of the Global Financial Crisis, identified a number of factors that pushed the economy into a recession followed by stagnation. The most important ones include:

1. Japanese Yen appreciation enforced by the Plaza Accord;
2. Steady deterioration in the health of the banking system;

Over the twenty two years between 1951 and 1973 the Japanese economy grew on average by 9.2% per annum – with such an amazing record of economic growth, while simultaneously running large current account surpluses, Japan was considered by many a crisis-free economy (Itoh, 1994). The economic policy run by the United States at that time, on the other hand, involved combining significant budgetary expansion, and high counter-inflationary interest rates, resulting in large trade deficit and a higher value for dollar (Hamada and Okada, 2009).

The Plaza Accord was an agreement intended to restore the savings-investment balance of the United States, signed in September 1985 in New York City by the representatives of the Group of Five – France, Japan, the United Kingdom, the United States, and West Germany – with an explicit aim of coordinating their policies in order to cause a depreciation of the US dollar against other currencies, including the Japanese yen (Fletcher, 2012). Prior to 1985 the fragile appreciation of the dollar
against the yen was driven primarily by speculative monetary investment, which fell sharply after the signing of the Plaza Accord (Itoh, 1994).

As a result, the yen appreciated dramatically while the Japanese economy was simultaneously slowing down (Kusukawa, 1994). The Japanese industry took a full advantage of the declining prices of raw materials and energy, resulting primarily from decreasing energy prices combined with a cheaper price of imports, although the positive effects of this stronger industrial performance were largely offset by the increasing importance of services sector and rising costs of labour (ibid.). Medium and small enterprises, however, less competitive internationally, were harmed by the appreciation of the yen, and saw their profits decline rapidly with many forced into liquidation (ibid.).

The increase in wealth associated with the appreciation of the yen, together with the decision of the Bank of Japan to reduce its official interest rate from 5% in 1985 to 2.5% in 1987, resulted in faster growths in the Japanese stock exchange that began accelerating in 1986 (Itoh, 1994). The private sector’s demand for traditional banking services, loans and deposits, was decreasing, while the demand for more speculative financing was on the rise (ibid.).

Although the Japanese stock market declined in response to the Black Monday on Wall Street in October 1987, the monetary authorities remained reluctant to increase interest rates for almost two more years (Kusukawa, 1994). The prices of real estate in the meantime more than doubled between 1986 and 1988 (Itoh, 1994), and increased by a factor of five by mid-1991 (Fletcher, 2012). The Bank of Japan’s easy money policy also fuelled aggressive corporate speculative investments, while real investments in capital remained small and stagnant (Itoh, 1994).

By early 1990, the Japanese monetary authorities realised that the economy is overheating, and so, in order to prepare it for a soft landing, they began increasing the official interest rate from 3.25% in May 1989 to 6% in August 1990 – the plan, however, did not work, and the higher interest rate served as a catalyst only accelerating the speed at which the asset bubble deflated (Fletcher, 2012).

Just like in case of any other asset bubble, the growth of prices in the Japanese real estate market was expected to continue indefinitely, which encouraged the banks to expand their mortgage facilities, offering loans based on 100% of the value of the
property against which the mortgage was made (Kusukawa, 1994). Following the collapse of the bubble, however, property prices declined, and with the quality of mortgages deteriorating they became increasingly difficult to liquidate (Itoh, 1994). With the total value of the bad loans held on banks’ balance sheets amounting to 7% of the gross domestic product, Japan experienced its first bank failures in more than 40 years (Hoshi and Kashyap, 1999).

In an attempt to contain the situation, the Bank of Japan began lowering its official interest rate in July 1991, reaching the level of 1.7% in September 1993 – the easy money policy combined with a fiscal stimulus package of tax cuts and direct government spending amounting to $430 billion, was supposed to provide emergency liquidity and stabilise the market (Kusukawa, 1994). Furthermore, the government established a number of institutions charged with the task of addressing the issue by buying bad loans, nationalising the most endangered banks, reorganising the banking supervision system, and providing ¥60 trillion for reorganisation and recapitalisation of banks, with further ¥7.5 trillion for emergency bailouts (Hoshi and Kashyap, 1999).

Despite further attempts to provide fiscal and monetary stimulus to the economy, including lowering the official interest rate to exactly 0%, between 1990 and 2003 gross domestic product grew on average by 1% per year (Fletcher, 2012).

A number of other factors, more specific to the Japanese banking system and its corporate culture, played an equally important role in the escalation of the Japanese crisis. Kanaya and Woo (2000) point out that the crisis was facilitated by regulatory weakness of the banking system, as the financial authorities, which had the power to revoke a bank’s license, intervened only after the distressed institution had become insolvent. Furthermore, the strict guidelines issued by the Tokyo Stock Exchange, requiring delisting of a company which incurred losses for three consecutive years, provided an incentive for the banks to manipulate their balance sheets in order to provide proof of meeting that requirement (ibid.). Due to widespread practice of paying low but consistent dividends to shareholders, regardless of financial performance of a firm, banks were also allowed to continue paying dividends out, even when it had become clear that the retained earnings would have helped
improving their profitability and capital base (ibid.). Finally, the loan classification rules, relatively lax compared to international best practice standards, failed to provide an accurate assessment of the extent of existing bad loans (ibid.). Miwa and Ramseyer (2002), on the other hand, argue that large Japanese firms obtained almost all their funding from the decentralised, and highly competitive capital markets, which ultimately allowed them to become hugely successful, particularly in the case of zaibatsu firms, that is large groups of corporations working together, which managed to accumulate enormous amounts of wealth and political power.

As mentioned before, the attempts of the monetary authorities and the government of Japan to stimulate economic growth by lowering official interest rates to the zero lower bound and by injecting trillions of dollars into the economy through increased government spending yielded hardly any results – over the thirteen years between 1990 and 2003, gross domestic product had grown by an average of 1% per year (Fletcher, 2012). Having reached the state in which monetary stimulation was no longer possible, the Japanese economy found itself in a liquidity trap described by Krugman (2000). In March 2001, the Bank of Japan decided to abandon conventional monetary policy and opted for the use of unconventional monetary policy, quantitative easing. This decision is reflected in Figure 19, by the period when the Bank did not quote any official interest rate. A technical explanation of how quantitative easing works is the main objective of the subsequent chapter, so for the purposes the comparative analysis offered in this chapter, the discussion focuses primarily on the effectiveness of quantitative easing in Japan.

Girardin and Moussa (2011) state that the new policy implemented by the Japanese central bank had been successful, as it had a positive impact on economic activity and prices. Furthermore, they argue that due to changes in regulatory environment resulting in a firm commitment to clean the balance sheets of banks of toxic assets, a purpose for which the Japanese government provided $460 billion, quantitative easing is much more effective after the quality of assets held on balance sheets had been improved.
However, taking into account the decision of the Bank of Japan to launch the eighth round of quantitative easing, announced on the 4th of April 2013, involving increasing an injection of $1.4 trillion into the economy within the next two years (Kihara and White, 2013), the arguments presented by Girardin and Moussa (2011) seem to be fairly detached from the reality – after all, if quantitative easing had been successful in stimulating economic growth in 2001, why would the Bank of Japan still use it as its main policy tool, particularly providing monetary stimulus of an unprecedented scale?

The comparative analysis between the Global Financial Crisis and the Japanese crisis of the 1990’s seems to be quite justified and capable of shedding some light on the effects that policies adopted as a response to the 2007 – 2009 Crisis might have on economic recovery, given that both crises appear to have a fairly similar origin – a real estate asset bubble, combined with excessive mortgage lending, and aggressive financial speculation. Furthermore, the monetary authorities, both in the case of Japan and in the case of the United States, can be blamed for fuelling the inflation of the market asset bubble by keeping their official interest rates on a really low level for far too long, as well as for taking the steps resulting in a sharp burst of the bubble by increasing the interest rates too aggressively.

The fiscal and monetary responses to both crises appear to be quite comparable as well – both countries used a combination of fiscal and monetary stimulus, followed by a switch to unconventional monetary policy, once the official interest rates reached their zero lower bounds.

With so many matching elements of the Global Financial Crisis and the Japanese crisis of the 1990’s, it is quite reasonable to ask the following question: are we too facing a lost decade of weak recovery and fragile growth?
Chapter V
Unconventional Monetary Policy

Unconventional monetary policy, in particular quantitative easing, has already been mentioned a number of times at various stages of the analysis presented in this dissertation, however, it has not been explained and described in detail until this Chapter. The relative uniqueness of this policy and the fairly limited body of existing literature describing it in great detail, despite the difficulty it presents, make the following analysis much more valuable in terms of academic research.

The term “unconventional monetary policy” is defined largely by what it is not, rather than what it actually is – it might involve setting negative official nominal interest rates, just like in case of Denmark, or expanding the central banks balance sheet through a series of asset purchases (Joyce, et al., 2012). Although explicit quantitative monetary targets were the main policy tool underpinning the monetary framework until the early 1980’s, when it was abandoned in favour of conventional monetary policy and its inflation targeting-based tools, as mentioned in Chapter IV, following the failed attempts to stimulate the Japanese economy in the late 1990’s, the Bank of Japan was forced to revert back to the regime of targeting quantitative monetary aggregates, giving it a new name – quantitative easing (Lyonet and Werner, 2012).

The current macroeconomic situation in the developed Western countries closely resembles the one characterising the Japanese lost two decades, and so the adaptation of credit easing by the United States and quantitative easing by the United Kingdom was only a matter of time.

The main problem for monetary policy in the period following the Global Financial Crisis stems from the fact the official interest rates controlled by the monetary authorities are constrained in their value by zero, as individual agents can always hold on to non-interest bearing cash, even though the Taylor Rule approach might suggest setting negative nominal interest rates (Joyce, et al., 2012). This particular problem renders conventional monetary policy ineffective at the moment, as given the fact that the nominal interest rate in the United Kingdom is already set at the level of 0.5%
since March 2009, and the nominal interest rate in the United States is set at the level of 0.25% since December 2008, the monetary authorities simply cannot lower their official interest rates any further to provide more liquidity to the market and ease the credit conditions in order to facilitate economic recovery. This situation represents a classic, textbook-like example of liquidity trap, described in detail in Chapter III.

Conventional monetary policy theory described by Woodford (2003), emphasised the importance of setting short-term nominal official rates of interest over the quantities of money involved in open market operations used as the policy transmission mechanism. As explained above, however, in the liquidity trap conditions, the conventional monetary policy mechanisms cease to be effective and have to be replaced by other tools and mechanisms. Essentially, as explained by Joyce, *et al.* (2012), quantitative easing focuses primarily on expansion of central bank’s balance sheet through asset purchases – with its ability to create unlimited quantities of acceptable means of payment, the central bank is able to buy a pre-specified amount of assets, be it government bonds or other types of assets issued by the private sector. These purchases change the composition of the portfolio of assets held by the private sector, with the final outcome resulting in a smaller proportion of previously owned assets, now purchased by the central bank, and a higher proportion of claims on the central bank, i.e. money (*ibid.*). Ultimately, both assets and liabilities of the central bank, the latter most likely held in form of reserves of the banking system, increase by the same amount.

Before the analysis moves further to discuss the transmission mechanism of quantitative easing, it is necessary to explicitly state the assumptions under which the policy might work. Eggertsson and Woodford (2003) established that under conditions that are similar to Ricardian Equivalence, whereby the private sector is indifferent between its own assets and the assets of the central bank or the government, an exchange of the assets will have no real effect on the economy. This fact was emphasised further in the paper by Joyce, *et al.* (2012), as they explicitly expressed the fact that in order to generate any impact through quantitative easing, portfolio switches have to make a difference for the investors.
There are two main channels through which quantitative easing operates – the portfolio substitution channel, and the bank funding channel. Figure 21 below provides a graphical representation of those channels.

In the case of the Bank of England, as explained by Joyce, et al. (2012), the portfolio substitution channel works in the following way:

1. The Bank purchases gilts, reducing their free float and increasing its reserves held by commercial banks, as most of the proceeds from those sales show up in bank deposits; since gilts and bank deposits are not perfect substitutes, the exchange of assets affects the duration of portfolio held by investors, as the swap of gilts for deposits is equivalent to trading a long-dated asset for a short-dated one;

2. In order to rebalance the duration of their portfolios, some investors will use the proceeds from the sale of their assets to buy another type of long-dated assets;

3. By reducing the stock of privately owned long-dated assets, the Bank of England lowers the duration risk which should result in lower premium requirements, which combined with portfolio duration rebalancing result in increases in prices of long-dated risky assets, most importantly, corporate bonds and equities;

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7 Joyce, et al. (2012), p. 278
4. Higher prices of the assets mentioned above allow companies to raise funds more easily, and also result in capital gains for households, increasing their wealth, which in turn should lead to higher consumption or other form of spending, ultimately increasing aggregate demand and output in the economy.

The other channel through which quantitative easing operates, bank funding channel, is significantly less complicated and much easier to understand – as the central bank purchases gilts owned by private investors, the amounts of money deposited at banks increases, reflecting the proceeds from sales, as do the reserves held at the central bank – once the level of reserves exceeds the demand for liquidity, banks will become much more willing to expand their lending (Joyce, et al., 2012).

Having explained the design and transmission mechanisms of quantitative easing, the analysis will now focus on assessing the impact that the policy had on the real economy thus far, although taking into account the effects of quantitative easing on stimulating growth in Japan, it is natural to be very sceptical about the potential for stimulation the policy displays.

At this point, however, it is worth mentioning what the scale of the quantitative easing in the United Kingdom and in the United States has been since the programmes were initiated. In total, the Bank of England created additional £375 billion in three rounds of quantitative easing (Bank of England, 2013). It is much more difficult to assess the amount of new money created by the Federal Reserve, as its credit easing programme has explicit monthly quantity targets, unlike the British one with target amount specified for each round of stimulation. Nonetheless, during the first round of quantitative easing, the Federal Reserve bought $2.054 trillion of assets, followed by additional $600 billion during the second round, continuing to spend $40 billions a month, increased to $85 billions a month in December 2012, over the period of duration of the third round (Fawley and Neely, 2013).

The results of research carried out to estimate the effect of the large-scale asset purchases programmes, such as quantitative easing, on macroeconomic conditions suggests that the programme had rather modest but persistent effects on the real economy. Chen, et al. (2012) estimate that the effects on gross domestic product growth are unlikely to exceed a third of a percentage point, with little to none
inflationary consequences. The more positive effect, however, is reflected by the fact that the observed effect of asset purchases on gross domestic product growth puts upward pressure on the interest rate, suggesting that the monetary authorities may be able to return to the previous framework under which they operated in the foreseeable future (ibid.). They also report that the commitment to of monetary authorities to keep the official nominal interest rate at the zero lower bound for a prolonged period has the potential to magnify the effects of a large-scale asset purchases programme (ibid.). Kapetanios, et al. (2012) report that without the application of quantitative easing, real gross domestic product would have fallen even more than it did in 2009, and inflation would have reached low or even negative levels. They do, however, emphasise the fact that due to the relative uniqueness of the policy, the use of counterfactuals in modelling is largely uncertain, and thus the presented results are subject to a significant degree of precariousness (ibid.).

Furthermore, the estimates provided by D’Amico, et al. (2012) suggest that the two rounds of large-scale asset purchases carried out by the Federal Reserve amounted to a substantial monetary easing, equivalent to the effect that reducing the interest rate by 140 basis points as far as the first round is concerned, and by 180 basis points during the second round, under the conventional monetary policy framework would have had.

Interestingly enough, another study into the effects of quantitative easing on the gilt market found that the programme might have had diminishing effects on the market, as once market participants learnt more about the operations of the asset purchase programme, both the importance and the effects of the gilt auctions carried out by the Bank of England have decreased (Joyce and Tong, 2012).

The results of research carried out by Lyonnet and Werner (2012), on the other hand, yielded conclusions that stand in the direct opposition to the ones presented above. Their study found no empirical evidence that the changes in the Bank of England’s balance sheet have had any impact on nominal gross domestic product or any of the intermediary targets specified by the Bank, such as interest rates or maturity structures of its outstanding operations (ibid.). Furthermore, the authors criticise other studies, including some of the mentioned above, for defining the effectiveness of quantitative easing not in terms of its final economic outcome, but in terms of the impact that the
policy may have on some of the intermediary targets, which may display a rather tenuous connection with the ultimate objectives of the policy (ibid.).

As far as the impact of large-scale asset purchases programmes on the financial markets is concerned, Bean (2011) emphasises the importance of the £185 billion Special Liquidity Scheme introduced by the Bank of England in April 2008 allowed banks to swap the toxic mortgage-backed securities and other illiquid assets for Treasury bills, whereas the Discount Window Facility provided financial institutions requiring financial aid with access to short-term liquidity.

Similarly, D’Amico, et al. (2012) highlight the importance of the decision of the Federal Reserve to purchase significant quantities of debt securities from the Government Sponsored Entities, Fannie Mae and Freddie Mac, together with a large proportion of mortgage-backed securities guaranteed by the two agencies, amounting to $1.25 trillion, promoting greater stability in the hugely distressed markets.

As any other economic policy, quantitative easing exhibits certain risks. First of all, there is a good chance that the central bank will make losses on its purchases, a cost that will ultimately have to be borne by taxpayers either by paying a higher tax rate or due to an increase in inflation rate (Giles, 2013). Second, too much quantitative easing may result in higher future inflation, or even hyperinflation, destroying the value of currency (ibid.). This issue is fairly similar to the one presented in Chapter III, concerning fiscal consolidation – too much of quantitative easing may have adverse effects on the economy, whereas not enough may not yield any results, which puts the monetary authorities in a situation whereby a correct estimation of the scope of the programme becomes hugely important. Finally, given that various unconventional monetary policies are in a way the last resort of monetary authorities, applying quantitative easing over a really long horizon can be counterproductive, as it may destroy the confidence in the economy (ibid.).

Palley (2011) also mentions that one of the main problems associated with current post-Crisis macroeconomic environment is the persistently high rate of structural unemployment, an issue that cannot be fixed by easy money policy. Furthermore, on the basis of accepting quantitative easing as the second-best theory defined by Lipsey and Lancaster (1956), which discusses the possible policy outcomes when one or
more optimal conditions cannot be satisfied, fixing one market imperfection in the presence of many other may actually worsen the overall outcome.

To summarise, with the monetary authorities facing severe constraints of their ability to use conventional monetary policy to stimulate economic growth, as they reached the zero lower bound of interest rates in 2009, adopting unconventional monetary policies became a necessity. Although it still remains fairly uncertain what the final effects of the programmes adopted by the Federal Reserve and the Bank of England are, it is fair to say that they have succeeded in enabling the financial markets to stabilise following the recent Crisis, allowing banks to rebuilt their damaged balance sheets and encouraging the return of growth in the stock market (De Vita and Abbott, 2011). By repeatedly communicating their firm commitment to the new policy, the monetary authorities also made a valid contribution to the hampering of the escalation of uncertainty about the future of the economy and the markets that was so apparent during the Crisis itself, despite the fact that its application might have sent mixed signals to the investors.

Bearing in mind, however, that the recovery in advanced economies still remains weak and fragile, it remains to be seen how the effects of quantitative easing will be assessed once the period of instability and low growth associated with the Global Financial Crisis is over. With the benefit of hindsight, however, particularly taking into account the Japanese experience with unconventional monetary policy, the author of this dissertation is rather sceptical about the policy’s true potential and its ability to foster economic growth.
Chapter VI
Quantitative Research

The analysis presented thus far focused primarily on providing a theoretical discussion of the impact that the identified economic policies had on the pre- and the post-Crisis economic environment. This chapter presents a more quantitative approach to the aforementioned analysis, enhancing the theoretical discussion with a numerical assessment of some policies.

The quantitative research presented in this chapter provides an assessment of three policies in particular – conventional monetary policy, quantitative easing, and fiscal stimulation. Each of the analyses begins with a brief technical explanation of the principles underpinning the policy (an in-depth explanations were presented in Chapters II, III, and V), followed by an outline of the methodology used to assess it, with a discussion of results concluding each section.

Conventional monetary policy, explained in detail in Chapter II, aims at achieving low and stable inflation by applying inflation targeting as the main policy rule, using a framework that can be approximated by the Taylor Rule (Joyce, et al., 2012). The Rule captures the relationship between nominal official interest rate, target level and actual level of inflation, and output gap, that is the difference between the equilibrium and the current level of output (Mankiw, 2008). Equation 1 provides a mathematical formulation of the Rule:

Equation 1: Taylor Rule Equation

\[ i = \pi^T + \pi^A + \alpha(\pi^A - \pi^T) + (1 - \alpha) \times (\overline{P} - Y), \]

where: \( i \) – nominal official interest rate; \( \pi^T \) – target inflation level; \( \pi^A \) – actual level of inflation; \( \overline{P} \) – long-term level of output; \( Y \) – current level of output; \( \alpha \) – a positive coefficient.

Following the approach based on Keynes’s (1973) “General Theory of Employment, Interest, and Money” described by Dickens (2011), Equation 1 is transformed to reflect the long-term equilibrium position as being characterised by the natural rate of unemployment. The relationship between inflation and unemployment was developed further by Friedman (1968), and was defined as the non-accelerating inflation rate of
unemployment, that is the rate of unemployment required to stop the inflation rate
from increasing.

The final element required to complete the transformation of Equation 1 is the
relationship between changes in unemployment and changes in output. This
relationship, investigated thoroughly by Okun (1970), is based on an empirical
observation of a decrease in output associated with an increase in unemployment
(Prachowny, 1993).

Applying the theories described above allows transforming Equation 1 into Equation
2:

**Equation 2: Modified Taylor Rule Equation**

\[
i = \pi^T + \pi^A + \alpha(\pi^A - \pi^T) + (1 - \alpha) \times c \times (NAIRU - U)
\]

where: \(i\) — nominal official interest rate; \(\pi^T\) — target inflation level; \(\pi^A\) — actual
level of inflation; \(c\) — Okun factor; \(NAIRU\) — non-accelerating inflation rate of
unemployment; \(U\) — current level of unemployment.

Using Equation 2 allows modelling the optimal nominal official rate of interest for
a given economy, based on the current level of inflation and the current level of
unemployment. The presented analysis modelled the nominal official interest rate for
the United States, the United Kingdom, and the European Monetary Union for the
period between the 31\textsuperscript{st} of January 2000 and the 31\textsuperscript{st} of December 2012.

The model relies on a number of assumptions reflected in some of the input values.
First of all, the model assumes that all of the aforementioned economies have a target
level of inflation of 2%. Second, the value of Okun factor is assumed to be equal to 2,
implying that a 1% increase in unemployment is associated with a 2% decrease in
output. Third, as suggested by Taylor (1993), the value of the \(\alpha\) coefficient is assumed
to be equal to 0.5. Finally, the value of the non-accelerating inflation rate of
unemployment is assumed to be 6.2% for the United Kingdom, 5% for the United
States, and 8.75% for the European Monetary Union.

The aforementioned assumptions allow transforming Equation 2 into its final form,
Equation 3, used in the modelling process:

**Equation 3: Taylor Rule Equation Used in Modelling**

\[
i = 2 + \pi^A + 0.5(\pi^A - 2) + 0.5 \times 2 \times (NAIRU - U)
\]
The remaining input variables, that is the current level of inflation and the current level of unemployment, were obtained from Bloomberg Database using the following indices:

- **UKBRBASE** – Bank of England Base Rate;
- **UKHCA9IQ** – UK CPI Excluding Energy, Food, Alcohol, and Tobacco;
- **UKUEILOR** – UK International Labour Organisation Unemployment Rate;
- **FDTR** – Federal Reserve Target Rate;
- **PCE CYOY** – US Personal Consumption Expenditure Core Prices Index;
- **USURTOT** – US Total Unemployment Rate in Labour Force;
- **EURR002W** – European Central Bank Main Refinancing Rate;
- **CPEXEMUY** – Eurostat Harmonised Index of Consumer Prices;
- **UMRTEMU** – European Monetary Union Unemployment Rate.

The results are presented below in three charts (Figures 22 – 24) portraying the official interest rate together with the modelled optimal interest rate, and indicating the extent of discrepancy between the two during the studied period. Table 2 provides a summary of the outputs generated by the models.
Figure 23: Official/Modelled Interest Rate in the United States

Figure 24: Official/Modelled Interest Rate in the European Monetary Union
Table 2: Model Output Summary

<table>
<thead>
<tr>
<th>Year 8</th>
<th>United Kingdom</th>
<th>United States</th>
<th>European Monetary Union</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Official</td>
<td>Model</td>
<td>Difference 9</td>
</tr>
<tr>
<td>2000</td>
<td>5.75</td>
<td>1.45</td>
<td><strong>4.30</strong></td>
</tr>
<tr>
<td>2001</td>
<td>6.00</td>
<td>2.75</td>
<td><strong>3.25</strong></td>
</tr>
<tr>
<td>2002</td>
<td>4.00</td>
<td>4.55</td>
<td><strong>-0.55</strong></td>
</tr>
<tr>
<td>2003</td>
<td>4.00</td>
<td>4.45</td>
<td><strong>-0.45</strong></td>
</tr>
<tr>
<td>2004</td>
<td>3.75</td>
<td>4.20</td>
<td><strong>-0.45</strong></td>
</tr>
<tr>
<td>2005</td>
<td>4.75</td>
<td>4.45</td>
<td><strong>0.30</strong></td>
</tr>
<tr>
<td>2006</td>
<td>4.50</td>
<td>4.05</td>
<td><strong>0.45</strong></td>
</tr>
<tr>
<td>2007</td>
<td>5.25</td>
<td>4.10</td>
<td><strong>1.15</strong></td>
</tr>
<tr>
<td>2008</td>
<td>5.50</td>
<td>3.95</td>
<td><strong>1.55</strong></td>
</tr>
<tr>
<td>2009</td>
<td>1.50</td>
<td>2.55</td>
<td><strong>-1.05</strong></td>
</tr>
<tr>
<td>2010</td>
<td>0.50</td>
<td>4.05</td>
<td><strong>-3.55</strong></td>
</tr>
<tr>
<td>2011</td>
<td>0.50</td>
<td>3.80</td>
<td><strong>-3.30</strong></td>
</tr>
<tr>
<td>2012</td>
<td>0.50</td>
<td>2.80</td>
<td><strong>-2.30</strong></td>
</tr>
</tbody>
</table>

Before the implications of the results presented above are discussed, it is worth asking the question whether the output variables of the model are sensitive to changes in the values of the fixed input variables, i.e. target level of inflation, value of the Okun factor, and the value of the non-accelerating inflation rate of unemployment.

The target level of inflation rate is the least problematic variable, as the monetary authorities of the three economies have an explicit target of 2%, which remained at the same level throughout the studied period. As far as the value of the non-accelerating inflation rate of unemployment is concerned, Dickens (2011) suggests that it might have slightly increased since the first quarter of 2011, as he reports an increase from 5% to 5.8% in the United States, however, it remains uncertain whether this change is going to be a permanent one, therefore the rates used in the model are

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8 The 31st of January of the given year;
9 Measured as the difference between the official nominal interest rate and the modelled nominal interest rate.
appropriate to be used at their initial values, particularly as the observed change in the non-accelerating inflation rate of unemployment level can be associated only with a minor proportion of the investigated period. Finally, the value of the Okun factor is estimated to be between 2% and 3% (Prachowny, 1993), however, increasing its value in the model itself does not result in a significant change of the observed patterns, although the magnitude of the discrepancy between the official nominal interest rate and the modelled one is somewhat different.

The outputs generated by the model for the three investigated economies confirm the line of argument presented in Chapter II, putting a significant proportion of the responsibility for excessive credit growth on the monetary authorities. Particularly in the case of the United States and the European Monetary Union the official nominal interest rates were consistently set below the optimal rate since 2002, only to move closer to their optimal values in the run-up to the Global Financial Crisis, when it was already too late to contain the problem.

This leads to a situation whereby it is appropriate to question the extent to which monetary authorities follow the policy rules they are supposed to operate under – although formulated in the late 1930s, the argument that the government-regulated monetary systems tend to perform rather poorly (Smith, 1990) seems to be still relevant. This issue was raised many times by F. A. von Hayek, most notably in his “Prices and Production” (2008), where he argued that central banks have a natural tendency to suppress the nominal interest rate below its natural level contributing to inflationary credit expansion, which this dissertation has identified as one of the most important factors contributing to the creation of the economic imbalance that ultimately gave birth to the Global Financial Crisis.

Unlike the other two, the results for the United Kingdom are somewhat surprising, as taking into account that it was the country most affected by the Global Financial Crisis in Europe, one would expect the pattern of behaviour of the official nominal interest rate and the modelled one to be similar to the ones exhibited by the United States and the European Monetary Union. This discrepancy leads to the conclusion that the policy followed by the Bank of England was much more prudent than it was in the case of the monetary authorities of the other economies mentioned earlier, suggesting that the main driver of the Crisis in the United Kingdom was the global
spreading of the leveraged speculation on derivative instruments discussed in detail in Chapter I.

Having established that the monetary policy followed prior to 2007 made a significant contribution to the escalation of the Global Financial Crisis, the analysis presented in this chapter will now focus on the unconventional monetary policy that dominated the post-Crisis economic environment, i.e. quantitative easing. The policy will be assessed on the basis of the strength of the relationship between the variables underpinning it, rather than by an application of a model like in the case of conventional monetary policy assessed above.

The discussion presented in Chapter V identified two channels through which quantitative easing impacts the general economy. A thorough assessment of both channels would go far beyond the scope of this dissertation, therefore the analysis presented in this chapter will focus primarily on the bank funding channel, that is the channel designed to improve the availability of bank credit (Joyce, et al., 2012). In principle, by rebalancing the portfolio of assets held on the central bank’s balance sheet, the bank creates new money, used to increase the money reserves of commercial banks, ultimately increasing the supply of consumer credit (ibid.). Higher consumer credit supply, should, at least in theory, lead to higher consumption and higher aggregate demand, which eventually should increase the final target variable, gross domestic product.

The assessment of this process is carried out in two steps: first, the analysis investigates the relationship between money supply and consumer credit supply; then, the relationship between consumer credit supply and gross domestic product growth. Differing from the approach to the assessment of conventional monetary policy, only two economies will be investigated here, the United States and the United Kingdom, as the credit easing and quantitative easing programmes carried out by the monetary authorities of those two countries were the most extensive ones. However, as pointed out by Kapetanios, et al. (2012), due to the uniqueness of quantitative easing, which makes the use of counterfactuals fairly unpredictable, even the most technically demanding and advanced estimates of the effectiveness of policy are subject to a significant degree of uncertainty.
The study provides an analysis of regressions carried out on two samples: the first sample covers the period from the 30th of April 1993 until the 31st of January 2013 for the United Kingdom, and from the 31st of January 1980 until the 31st of January 2013 for the United States, reflecting the extent of the available data, whereas the second sample covers the post-September 2008 period. The first sample serves as a benchmark for assessment of the policy employed in the post-Crisis economic environment.

The data used in the following regressions were obtained from Bloomberg Database using the following indices:

- **UKMSM41M** – UK Money Supply Growth;
- **UKMSB3PS** – UK Consumer Credit Supply Growth;
- **UKGRABIQ** – UK Real GDP Growth;
- **M2%Y0Y** – US Money Supply Growth;
- **CICRTOT** – US Consumer Credit Supply Total Net Change;
- **GDPCQ0Q** – US Real GDP Growth.

It is also necessary to point out that for the purposes of the analysis of the relationship between consumer credit supply and gross domestic product growth, given the fact that the growth rates are quoted as quarterly rates, the monthly consumer credit supply rates were converted into quarterly rates. The regressions results are presented below in eight graphs (Figures 25 – 32), followed by Table 3 providing details of output statistics for each regression.
Figure 25: Consumer Credit Supply and Money Supply in the United Kingdom 1993 – 2013 (Regression 1)

Figure 26: Consumer Credit Supply and Money Supply in the United Kingdom 2008 – 2013 (Regression 2)
Figure 27: Consumer Credit Supply and Money Supply in the United States 1980 – 2013 (Regression 3)

Figure 28: Consumer Credit Supply and Money Supply in the United States 2008 - 2013 (Regression 4)
Figure 29: Gross Domestic Product Growth and Consumer Credit Supply in the United Kingdom 1993 - 2013 (Regression 5)

Figure 30: Gross Domestic Product Growth and Consumer Credit Supply in the United Kingdom 2008 - 2013 (Regression 6)
Figure 31: Gross Domestic Product Growth and Consumer Credit Supply in the United States 1980 - 2013 (Regression 7)

Figure 32: Gross Domestic Product Growth and Consumer Credit Supply in the United States 2008 - 2013 (Regression 8)
## Table 3: Output Statistics for Regressions 1 - 8

<table>
<thead>
<tr>
<th>Regression</th>
<th>Number of Observations</th>
<th>Coefficient of determination</th>
<th>Intercept Coefficient</th>
<th>Slope Coefficient</th>
<th>Intercept Coefficient (p-level)</th>
<th>Slope Coefficient (p-level)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression 1</td>
<td>238</td>
<td>0.09327</td>
<td>0.53222</td>
<td>0.04432</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Regression 2</td>
<td>53</td>
<td>0.00813</td>
<td>-0.05323</td>
<td>-0.00493</td>
<td>0.38847</td>
<td>0.52073</td>
</tr>
<tr>
<td>Regression 3</td>
<td>397</td>
<td>0.00197</td>
<td>7.07299</td>
<td>-0.14876</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Regression 4</td>
<td>53</td>
<td>0.00027</td>
<td>4.91886</td>
<td>-0.11119</td>
<td>0.47908</td>
<td>0.90786</td>
</tr>
<tr>
<td>Regression 5</td>
<td>79</td>
<td>0.09693</td>
<td>0.28605</td>
<td>-0.22067</td>
<td>0.02025</td>
<td>0.00522</td>
</tr>
<tr>
<td>Regression 6</td>
<td>18</td>
<td>0.38255</td>
<td>0.10666</td>
<td>-0.66881</td>
<td>0.21496</td>
<td>0.00621</td>
</tr>
<tr>
<td>Regression 7</td>
<td>132</td>
<td>0.01128</td>
<td>2.28547</td>
<td>0.05448</td>
<td>0</td>
<td>0.22543</td>
</tr>
<tr>
<td>Regression 8</td>
<td>18</td>
<td>0.05068</td>
<td>0.915</td>
<td>-0.08051</td>
<td>0.30404</td>
<td>0.36908</td>
</tr>
</tbody>
</table>

The statistics presented above suggest that in the majority of the cases one cannot reject the null-hypothesis, due to the values of p-levels associated with individual coefficients. Regressions 2, 4 and 8 indicate that there is no statistical significance of the relationships between the investigated variables, implying that changes in money supply had no impact on consumer credit supply in the post-Crisis period both in the United Kingdom and in the United States, and that there is no significant relationship between consumer credit supply and gross domestic product growth in the United States post-September 2008.

Furthermore, in case of regressions 3, 5, 6, and 7, the null-hypothesis is only partially rejected, as the value of p-level associated with one of the coefficients is above the 0.01 cut-off level. This indicates that either the slope (Regression 3 and Regression 7) or the intercept (Regression 4 and Regression 6) of the linear function depicting the relationship between the two variables has to be assumed to be equal to zero.

The only relationship that is statistically significant is the one between money supply and consumer credit supply in the United Kingdom between 1993 and 2013. Once the value of the coefficient of determination ($R^2$), indicating how well the model replicates the actual results, is taken into account one can conclude that none of the associations outlined above can be used as a proof that the theoretical relationships
underpinning the bank funding transmission channel reflect any real-life cause and effect links between the main variables.

It is also worth investigating one other aspect associated with the effects of quantitative easing, frequently used as an example of the policy being a success, i.e. its impact on the long-term interest rates.

The following regression models the relationship between change in long-term interest rates between two consecutive periods in Japan, the United Kingdom, and the United States, and the gross domestic product growth rates associated with the same period.

The long-term interest rates data were obtained through Bloomberg Database using the following indices:

- **EOUKR001** – UK long-term interest rate;
- **EOUSR001** – US long-term interest rate;
- **EQJPR001** – Japan long-term interest rate.

The data and the regression line are presented in Figure 33, with summary statistics included in Table 4.

![Figure 33: Gross Domestic Product Growth and Long-term Interest Rate Change (Regression 9)]
The information presented in Table 4 yet again suggests that there is no significant relationship between investigated variables, despite the fact that the null-hypothesis was rejected for the value of the intercept coefficient. With the value of the coefficient of determination equal to 0.00768, implying that the model accurately reflects $0.768\%$ of real-life observations, it is rather natural to be sceptical about the ability of quantitative easing to stimulate growth by suppressing long-term interest rates.

Although the analysis presented above relies on a very simplistic view of the transmission mechanisms of quantitative easing, while ignoring a number of other factors, such as the importance of the fact that commercial banks are currently much more likely to use the additional funds to increase their own cash reserves in case the inter-bank lending market comes to a halt again and to insure themselves from further defaults of derivative securities (Fitz-Gerald, 2012), rather than to issue new loans to consumers, it provides a starting point for an argument similar to the one presented by Lyonett and Werner (2012) stating that despite some success, quantitative easing fails to achieve its main objective of stimulating economic growth.

It seems that the comparison between quantitative easing and the Apollo 13 lunar mission used by De Vita and Abbott (2011) might be quite appropriate at this point – application of quantitative easing represents an anti-crisis rescue mission that, just like Apollo 13 failed to achieve its main objective of landing on the Moon, fails to stimulate consumption and economic growth, however, the policy has certainly allowed the banks to repair their balance sheets damaged so severely by the Global Financial Crisis and encouraged growth in the stock market, becoming a ‘successful failure’ (the term was used by Captain James A. Lovell, commander of Apollo 13, with reference to the fact that despite failing to achieve their main objective due to
a significant malfunction of their spacecraft, the astronauts managed to get back home safely).

Finally, the last policy assessed in this Chapter is fiscal stimulation through higher government spending. The analysis presented below is largely based on the ideas presented in Keynes’s (1973) “General Theory of Employment, Interest, and Money”. As explained by Begg, et al. (2008) the starting point of the discussion is the following basic equation:

\[ Income = Expenditure \]

Income levels portrayed on the horizontal axis of Figure 26 are associated with aggregate supply, whereas expenditure levels on vertical axis, with aggregate demand (Begg, et al., 2008).

Figure 34, known as the Keynesian Cross diagram, provides a graphical representation of the equation above – aggregate expenditure, represented by the 45° line, which links the points where the relationship mentioned above holds.

The next component of the analysis is the value of planned expenditure, that is the amount that equals to the sum of consumption, investment, net exports, and government spending for a given period – economic output is therefore defined as the point at which aggregate expenditure is equal to planned expenditure (Begg, et al., 2008).

To assess the effects of higher government spending, one should compare two planned expenditure schedules, \( E_1 \) and \( E_2 \) in Figure 26, with both representing the same level of consumption, \( C \), investment, \( I \), and net exports, \( NX \), but different levels of government spending \( G \) (in case of Figure 26, \( G_2 \) is greater than \( G_1 \)).

The Keynesian Cross highlights the apparent effects of higher government spending, showing that an increase in planned expenditure schedule, associated with greater spending, results in an even greater increase in economic output. Keynes (1973) attributes this to the multiplier effect, that is the fact that a $1 increase in government spending brings an at least $1 increase in income.
The relationship described above is tested using the United States as an example, as the stimulus programme introduced by the Obama administration in January 2008 was the most extensive one among the economies affected by the Global Financial Crisis, amounting to $500 billion in 2009 and further $700 billion in 2010 (Hall, 2010a). Given the fact that Hall estimates the current value of the multiplier to be equal to more or less two, the expected results should indicate that a $1 increase in government spending brings a $2 increase in output.

The aforementioned relationship is tested using Regressions 10 and 11, depicted by Figures 35 and 36, which model the impact of change in government spending, associated with the change in budget deficit measured as the percentage of gross domestic product between two periods, on gross domestic product growth for the respective period. The data on budget deficit and gross domestic product growth were obtained through Bloomberg Database using the following indices:
Again, Regression 10 serves as a benchmark for Regression 11, as the former uses data covering the period between the first quarter of 1980 and the last quarter of 2012, and the latter the period between the third quarter of 2008 and the last quarter of 2012. Table 5 that follows Figures 35 and 36 provides summary of regression statistics for both regressions.

Figure 35: Gross Domestic Product Growth and Change in Budget Deficit in the United States 1980 – 2012 (Regression 10)
The results summarised in Table 5 are largely unexpected and very surprising, as they suggest that the theoretical relationship described by Keynes is exactly the opposite of what is empirically observed.

Although the relationship captured by Regression 10 is statistically significant, as the values of p-levels for both coefficients recommend rejecting the null-hypothesis, its coefficient of determination is rather low at 11.843%, implying that the model accurately explains only less than 12% of real-life observations. Regressions 11, on the other hand, displays a much higher coefficient of determination, 47.692%, so the accuracy of the model is significantly better, however, with the p-level value of 0.06874 the null-hypothesis cannot be rejected for its intercept coefficient.
Nonetheless, both regressions imply that fiscal austerity has much more desirable effects than fiscal stimulus in terms of gross domestic product growth. Of course, the model used in Regression 10 and 11 is rather overly simplistic, ignoring the impact that changes in the values of the remaining components of planned expenditure schedule, which occurred during the investigated period, might have had on the gross domestic product growth rates; however, it still yields some interesting results worth mentioning in this chapter.

The results of quantitative research analysis presented in this chapter can be summarised by saying that there was a significant discrepancy between the nominal interest rate policy followed by monetary authorities prior to the Global Financial Crisis and what the underpinning framework of tools identified as the optimal interest rate policy. Furthermore, despite the lack of any apparent relationship between variables upon which the policy of quantitative easing is based, it can be dubbed a ‘successful failure’, as it managed to aid the recovery of the financial sector and the stock market, even though there is no empirical evidence that it contributes to achieving its main objectives in any way.

Finally, perhaps instead of focusing on fiscal stimulation policy, governments should channel their efforts towards decreasing the levels of their indebtedness, in order to move closer to the economic environment identified by Claessens, et al. (2010) which is characterised by sound economic conditions, including a current account surplus and greater capability of running fiscal deficit when required, in which economic shocks can be absorbed better and growing out of a recession can be achieved more easily.
Summary

The Crisis is far from over – over the seven months during which the research presented in this dissertation was carried out and analysed, the United States adopted severe measures enabling it to avoid falling of the fiscal cliff (Ferraro and Whitesides, 2013), the United Kingdom lost its AAA credit rating (Fincher and Bases, 2013), and Cyprus faced a week-long bank run which eventually forced it to accept emergency funding from the International Monetary Fund and the Eurozone. Although the Global Financial Crisis has already evolved in its nature from a complex multi-market crisis originating in the American housing market into a sovereign debt crisis, the issues described in this dissertation are still developing further, which makes the issues analysed throughout this paper highly relevant in the difficult macroeconomic conditions faced by the Western advanced economies.

The research objectives outlined in the Preface clearly have been achieved – Chapter I identified the originate-to-distribute lending model, the impact of complex derivative products, and the actions of Fannie Mae and Freddie Mac, two U.S. Government Sponsored Entities, as the main drivers contributing to the rapid inflation of the housing market asset bubble, and to the global escalation of the Crisis; Chapter II provided a thorough assessment of the policies associated with the period of the Great Moderation, which unintentionally promoted a series of asset bubbles, while simultaneously contributing to a decreased perception of macroeconomic risks; Chapter III investigated the post-Crisis environment and identified the rising debt levels and borrowing costs as the main justification for adopting fiscal consolidation policies, together with the conditions similar to a liquidity trap as the rationale behind the switch of various monetary authorities from conventional monetary policy in favour of more unconventional policies, in particular quantitative easing; Chapter IV provided a comparative analysis between the Japanese crisis of the 1990’s and the Global Financial Crisis, highlighting the resemblance of their causes and policy responses to them, suggesting that perhaps the Global Financial Crisis was not as unprecedented as it is considered to be; Chapter V offered a detailed insight into unconventional monetary policy, its transmission mechanisms, and its effectiveness,
suggesting that although it encouraged the return of growth in the stock markets, its impact on the recovery has been rather modest; and finally, Chapter VI presented the results of quantitative assessment of various economic policies, with its most important contribution being the identification of a significant discrepancy between the policy actually followed by the monetary authorities and the optimal policy recommended by the theoretical framework they were supposedly following.

It seems that the words of F.A. von Hayek (1989) said during his Nobel Memorial Lecture in 1974 might be particularly relevant to the current economic situation: “The economists are at this moment called upon to extricate the free world from the serious threat of accelerating inflation which, it must be admitted, has been brought about by policies which the majority of economists recommended and even urged governments to pursue. We have indeed at the moment little cause for pride: as a profession we have made a mess of things” (Hayek, 1989: p.3). Although he was talking primarily about the problems the world faced during the period of the Great Inflation, it seems to me that the exact same argument can be made with reference to the threat of the excessive debt growth.

The contents of this dissertation make it quite apparent that the top – down approach to economic recovery, despite some success that cannot be denied, is not enough to foster economic growth. In spite of this, abandoning it completely would prove infinitely costly and counterproductive, however, perhaps what the world economy is in need of at this point is the introduction of more bottom – up initiatives – after all, we, the people, are the economy.

The constantly growing body of literature on the Global Financial Crisis focuses on various issues that were not analysed in this dissertation, ranging from comparative analysis of the Great Depression and the Great Recession (see: Alcidi and Gros, 2011), through a more theory-based criticism of the New Financial Architecture (see: Crotty, 2009), to the effects of the Crisis that are still really difficult to explain (see: Hall, 2010b).

It was the author’s best intention to provide a balanced and objective view of the issues discussed throughout this dissertation in order to present an analysis free from bias and inconsistency, and thus create an academic work of some value.
Unfortunately, as mentioned a number of times at various stages of the discussion and analysis presented in this paper, the scope of this dissertation meant that providing a more thorough insight into certain aspects of the factors contributing to the escalation of the Global Financial Crisis or a far more technical analysis of macroeconomic policies and tools available to policy-makers would be particularly difficult.

It is the author’s hope, however, that the ideas examined in this dissertation have been presented in an interesting and engaging manner, and will encourage further research into this extremely fascinating and hugely important topic that had such a tremendous impact on the world over the last six years and still continues to shape the present times as well as the future.
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