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**Kvantitativní uvolňování versus
tzv. "helicopter money" a jejich účinnost**

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Čestné prohlášení

Prohlašuji, že bakalářskou práci na téma „Kvantitativní uvolňování versus tzv."helicopter money" a jejich účinnost“ jsem vypracovala samostatně a veškerou použitou literaturu a další prameny jsem řádně označila a uvedla v přiloženém seznamu.

V dne.....

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Abstrakt

Bakalářská práce zkoumá vliv kvantitativního uvolňování na ekonomiky USA, Velké Británie a Eurozóny, zaměřuje se hlavně na podmínky a strukturu ekonomiky, které determinují rozsah a velikost efektu. Analýza ukázala, že nekonvenční měnová politika měla omezený dopad v Eurozóně, neboť bankovní sektor vykazuje velmi špatné výsledky v porovnání s efektivní implementací politiky v USA a ve Velké Británii, kde hlavní role alokování aktiv byla dána finančnímu trhu. Experimentální koncept nazvaný Helicopter Money je představen jako nová metoda pro země Eurozóny, která by měla podpořit hospodářský rozvoj. Výhody a nevýhody Helicopter Money jsou obecně diskutovány dobře známými ekonomy, stejně jako mechanismy jeho implementace. Byly aplikovány makroekonomické modely a teorie, aby se ukázal bližší pohled na koncept. Autorka práce vidí vysoký potenciál pro Eurozónu v krátkodobém i dlouhodobém horizontu za podmínky, že větší nabídka peněz bude podporována korespondující fiskální politikou.

Klíčová slova: Kvantitativní uvolňování, Helicopter Money, Světová hospodářská krize, Evropská dluhová krize, Kvantitativní teorie peněz, makroekonomické modely.

JEL klasifikace: G01, E58, E17, G20.

Abstract

The bachelor thesis examines the impact of the Quantitative Easing on the economies such as the USA, the UK, and the Eurozone, it focuses on the economies' conditions and structure that determine the size of the effect. As a result, the analysis has shown a limited impact of unconventional monetary policy in the Euro area as the banking sector performs very poorly comparing to the effective implementation in the US and the UK, where the main role of asset allocation was given to financial market. The new concept called the Helicopter Money is introduced in the paper as a new method for Eurozone countries to boost economic development. The advantages and disadvantages of Helicopter Money are broadly discussed by well-known economists as well as the mechanism of its implementation. The macroeconomics models and theories were applied in order to give a closer look at this concept. The author of this paper sees the high potential for the Eurozone in a short and a long-term on condition that the money drop will be supported by responsive fiscal policy.

Key words: Quantitative Easing, Helicopter money, World Financial Crisis, European Sovereign Debt crisis, Quantitative theory of money, macroeconomics models.

JEL classification: G01, E58, E17, G20.

Table of Contents.

Introduction	8
1. The collapse	9
1.1. <i>Reasons and consequences of the market meltdown in the US, undertaken comprehensive measures</i>	10
Policy application in the USA	12
1.2. <i>Anti-crisis measures in the United Kingdom</i>	14
The impact of policies on the banking sector	16
1.3. <i>The European Union, banking sector's shortcomings</i>	18
European Sovereign Debt Crisis of 2009 – 2013	20
Implementation of Quantitative Easing	23
2. The Helicopter Money	28
2.1. <i>The difference between Quantitative Easing and Helicopter Money</i>	29
2.2. <i>The implementation of Helicopter Money</i>	29
2.3. <i>Advantages and disadvantages</i>	31
The quantitative theory of money	32
2.4. <i>Helicopter Money potential, application of macroeconomic models</i>	33
The Market for Goods and Services and the Money market	33
The IS-LM model	35
The AD-AS model	36
The Solow model	38
Conclusion	43
Terms and definitions	45
References	47
List of figures	48
List of tables	48

Introduction

The total gross government debt, political instability, and unhealthy banking sector have been obstacles for Eurozone members in terms of improving their productivity and achieving economic growth. Southern economies have been performing increasingly weak. Thus, the public authorities face tough choices concerning the countries' economy in its attempt to boost its world competitiveness, all while trying to keep within the budget deficit limit set by the Eurozone of 3% of GDP (one of the Maastricht treaty).

Portugal, Spain, Italy, Greece are one of many countries that are still recovering from the heavy impacts of the financial crisis of 2008 and following Eurozone sovereign debt crisis. Central Banks all over Europe are still facing difficult decisions on how, when, and to what extent they should implement monetary policy in order to get the economy back on the right track when interest rates are already at or near zero level. Helicopter Money was suggested in order to boost Eurozone economy as an alternative to Quantitative Easing (QE), as QE did not seem suitable or could be even a threat to stability and credibility of the European Central Bank in a case of weak economic development and the heterogeneity of member states.

Considering these aspects, in this paper the following topics are examined:

- consequences of World Financial crisis,
- retaliatory policies in USA and UK according to economy structure,
- Quantitative Easing in Euro area,
- Helicopter Money and its potential for Eurozone,
- short-run and long-run possible impact.

For this paper, various sources such as open-access journals, textbooks, and online databases have been reviewed, in order to get an in-depth look at the specific topics and to provide a clear review onto the macroeconomic development of USA, UK and Eurozone members.

Thereinafter, this paper will investigate the methods of Quantitative Easing and Helicopter Money in depth, before looking at the potential of this method for Eurozone specifically. Finally, a conclusion on macroeconomic situation and development will be drawn considering its potential of Helicopter Money.

1. The collapse

The deepest global recession since World War II started with the collapse of Lehman Brothers in September 2008. Spreading uncertainty, it struck financial markets and investors all over the world. For the corporate sector funding via banks and markets became harder, many corporations went bankrupt or had to be restructured. With fall in demand in world markets, particularly for investment goods and manufacturing durables, trade sharply dropped. In addition, unemployment raised and remained at a high level over the medium term.

The World Financial crisis uncovered the inappropriate regulation of housing and capital markets as well as the banking system, that lead to the bankruptcy of many competent financial institutions. It specifically affected investment banks, insurance companies, commercial banks, mortgage lenders, and a number of companies or households who relied on credit. The crisis consequently contributed to European sovereign-debt crisis.

As the housing bubble collapsed and panic in many stock markets began, the situation exacerbated. Systemic risk called “too big to fail” appeared during a recession and caused problems throughout the financial system. The source of this risk were financial institutions that relatively large to their respective industries or highly interconnected with others.

When the economy’s slowdown became evident, governments and central banks globally had to bear the responsibility and take an action in order to protect households and businesses. For example, in USA government took taxpayer-financed bail-out of big companies such as AIG and Merrill Lynch, the nation’s largest brokerage company, in order to prevent bankruptcy and resist systemic risk. Also strong supportive macroeconomic policies were aimed at restoration of sustain healthy growth.

According to WSBI (2015), the financial crisis highlighted the existing relationship between financial systems and the real economy and displayed how single financial structures may respond variously to shocks and policy measures. The institutional formation of financial systems and the interaction between banks and non-bank financial institutions may also influence financial stability and recovery. Furthermore, financial systems are built up by different types of financial instruments and by how those instruments are used and in what proportion.

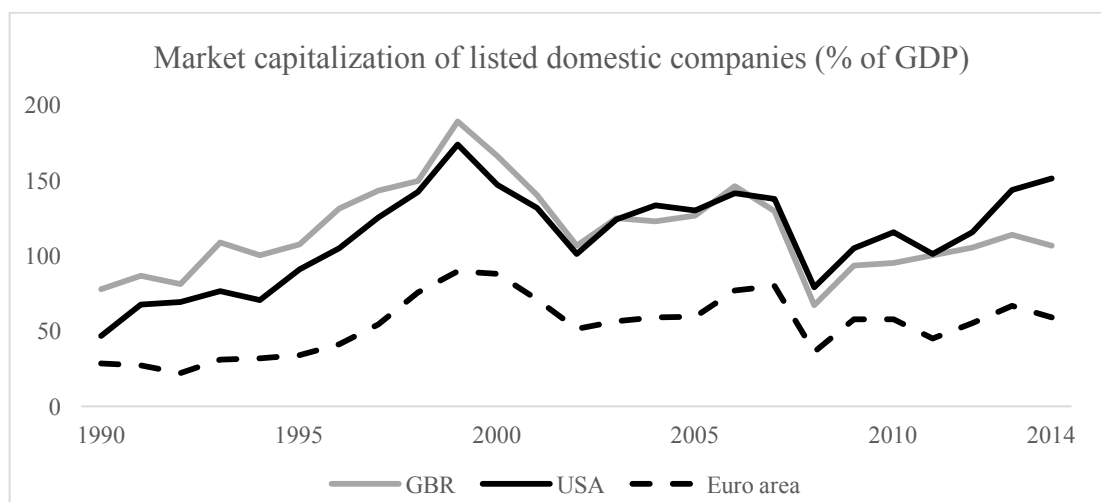


Figure 1 Market capitalization

Source: International Monetary Fund, World Bank and OECD GDP estimates

For example, in an Anglo-Saxon world, the capital markets are the prime source of raising capital for businesses. Many British and U.S. firms obtained external financing directly in the markets via stock and bond issues. There was a significant drop in markets, losing more than 30 % of their value in 2008 since then stock indexes continue gaining strength.

Brecht (2015) states that the European companies rely more on bank lending than on market funding. Overall, 80 % of corporate debt in Europe is in the form of bank lending, with just 20 percent coming from the corporate bond markets – almost inverse in the USA. In both funding structures, the problems are evident. It is crucial that the credit crunch uncovered shortcomings of regulation in the system: such as financial supervision and financial controlling.

Depending on the fundamental difference in corporate funding, different monetary policy approaches were implemented in order to recover the economy and ensure robust economic growth. From that point of view, the impact of these particular policies will be discussed in the paper below.

1.1. Reasons and consequences of the market meltdown in the US, undertaken comprehensive measures

It is vital to note, that the national economy of USA belongs to major ones among advanced economies. As reported by IMF, it represents 19% of nominal global GDP, the European Union and China estimate at 17 % and 13% accordingly. In particular, because of globalization and digitalization processes of the 21st century, the financial flows have no borders in terms of trading. This allows making transactions 24 hours a day across time zones and

borders. These are reasons why the financial crisis in the USA became global and endanger stability, so as revealed the inability of markets to self-confront the downturn.

The reasons behind the crisis are discussed broadly and in details, but the consequences are still visible. The essential factor was a high default rate of subprime mortgages. In 1977 US government design The Community Reinvestment Act to help low-income Americans to get affordable loans at a low-interest rate, it was modified over time by easing requirements (*"help meet the credit needs"*) in order to let more people get a mortgage loan. When interest rates on mortgages apparently increased, borrowers with poor credit history could not repay the loans. Risky loans passed to financial engineers at investment banks, who collected them in pools and turned them supposedly in the low-risk securities. The mortgage-backed securities and the collateralised-debt obligations (CDOs) had a low credit quality but offered attractive high returns in a world of low-interest rates. CDOs were divided into tranches by degree of risk to default. Agencies such as Moody's and Standard & Poor's evaluated safer tranches with the triple-A credit ratings, so that investors could trust and add securities into their portfolio. They were held globally mostly by financial firms.

In 2006 America faced nationwide house-price dramatic decline and housing-related securities slumped in value: "Safe" CDOs turned into worthless, despite the ratings agencies' seal of approval. As a result, it became harder to sell fishy assets at any price. Investors reported significant losses and crisis expanded from the housing market to stock markets.

In autumn 2008 the temporary suspension of trading took place when indexes slumped and price on stock significantly declined losing value. Many financial institutions were determined to go bankrupt, some of them were subjected to mergers and acquisitions.

In order to decrease uncertainty among investors and lenders, the Federal Reserve System made a reduction in short-term interest rate (federal fund rate) to the lower bound, *striving for liquidity provision* to the market and attempting to make interbank transactions possible. However, this did not support the activity in the interbank market. Commercial and investment banks were afraid to lend money and preferred to keep liquidity on their accounts. For that reason, to offset the collapse in demand, in December 2008 The U.S. Fed announced the unconventional monetary policy called Quantitative Easing (QE), later on, The Bank of England (BoE) started the similar policy.

The use of unconventional instruments was explained by the inability of traditional methods (such as influencing interest rate, which was already very low) to get the economy

back on track. The interventions were carried out in few steps according to the market and economy needs. As a matter of fact, the aim of that policy was to encourage economic growth and stabilize functioning of the financial system.

Generally speaking, the implementation of QE means the large-scale asset purchases in the secondary market funded by the creation of central bank reserves at close to zero interest rate with the possibility of future selling.

Haldane et al. (2016) explains that the credit risk of government bond's transfer is minimal since most government debt is conceived as low risk. Moreover, many central banks have gone further along the credit risk spectrum by purchasing private sector assets – so-called “credit easing”. Which is also known as a Qualitative Easing, the Citibank's chief economist W. Buiter defined it as a change in central bank balance sheet structure: shift toward less liquid and riskier assets without increasing in size.

The Bank of England (2016) defined the potential channels through which unconventional monetary policy might operate:

- Portfolio rebalancing - QE induces a switch into longer duration or higher risk assets,
- confidence/uncertainty – reduces the amount of volatility in markets or uncertainty about the outlook,
- bank lending – QE helps stimulate a rise in lending by banks.

Policymakers persistently emphasized the role of the portfolio balance channel as a key factor in the expected transmission of asset purchases to the rest of the economy, mainly directed to the real economy. According to this mechanism, purchases of financial assets increase liquidity and push up asset prices, as those who have sold assets to the central bank rebalance their portfolios into riskier assets. This, then, encourages expenditure by rising wealth and lowering borrowing costs for households and companies.

Policy application in the USA

In the USA an accommodative monetary policy continued from late 2008 until October 2014. It run in 4 steps at 1 %, then at 0 - 0.25 % Federal fund rate, the Quantitative Easing totally increased FeD's balance sheet by 500 % (from \$0.9 to \$4.5 trillion) in assets. For the first time since the financial crisis, the Committee began to normalize monetary policy by modestly raising its target for the Federal fund rate to 0.5 % in late 2015.

Main objects of the program were longer-term securities issued by the U.S government, assets backed by home loans: mortgage-backed securities. The Committee expanded the Federal Reserve's holdings of longer-term securities as a mean to put downward pressure on longer-term interest rates and make broader financial conditions more accommodative. Usually, central banks carry out policy by influencing short-term interest rate expecting at the same time long interest rate fluctuations. Transmission between short and long-term interest rates is positive during convenient economic conditions, but in a time of recession fail. So that the FeD and other central banks gave preference to influence long-term interest rates.

In *figure 2* below represented data of how the balance sheet changed over time when the purchase announcements took place:

- QE1 – March 2009,
- QE2 – November 2010,
- QE3 – September 2012.

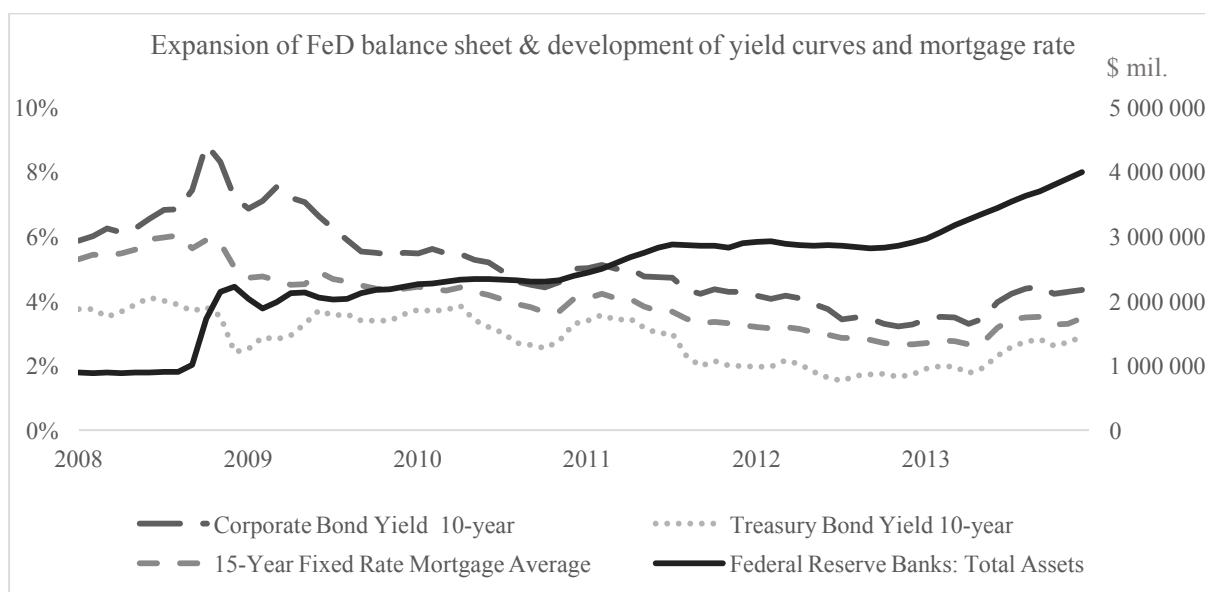


Figure 2 FeD balance sheet and yield of long-term securities

Comment: rates are represented on the left scale; the right scale represents the size of the balance sheet.

Source: Board of Governors of the Federal Reserve System (US)

By purchasing securities from public sector in the secondary market FeD decreased supply, causing an increase in investor's demand that went up the prices and lower yield on these long-term securities. As a result, mortgage rates and corporate bond yields fall as investors, who sold securities to the FeD, invest that money elsewhere.

The FeD's liquidity injections have affected investors' behavior in financial markets. The stock markets as NYSE, NASDAQ have shown recover, the indexes S&P 500 and Nasdaq

reaching new heights as a respond to robust corporate earnings and returns¹. In debt markets, OECD (2014) registers an increase of high-yield bonds insurance and yields have reduced. The mortgage debt has not risen contrasting house prices growth.

As the financial crisis struck on households and small businesses, the risk of private-sector failure rose. It could lead to a higher unemployment and continuing indebtedness. The American Recovery and Reinvestment Act (2009), enactment by US Congress, focused on saving existing jobs and create new ones in short-term. Other goals were to provide temporary assistance programs for those most affected by the recession and invest in infrastructure and science, energy efficiency in order to stop further economic deterioration.

Federal Reserve chairman, Ben Bernanke, said in 2012 that the expansive monetary policy indirectly raised economic activity by 3 %, supporting demand and stimulated job creation by two million in private sector. As interest rates were low, it improved household's finance so that had a result in a lowering cost of debt and the return to pre-crisis consumption level. Households increased their personal saving in order to stabilize their future financial position ('cautious' savings). Economic growth could also be stimulated by improving in firm's competitiveness and by the increase in oil production in the USA.

Weale and Wieladek (2014) state that the real GDP and inflation were respectively 3% and 1% higher as a result of the Federal Reserve's asset-purchase policy. In the middle of 2009, the economy was on the way to recovery, it got out of deflation in late 2009 reaching 2 % inflation by 2010, also the annual GDP growth rate established around 2% in late 2010 while in Euro area the growth did not remain constant.

In conclusion, the undertaken comprehensive steps had a positive impact on macroeconomic aggregates. The Quantitative Easing helped push the economy in the right direction.

1.2. Anti-crisis measures in the United Kingdom

When the housing bubble burst, it immediately created a fuss, speculators in a hurry started to sell securities triggering the market meltdown. As a respond to those conditions, in

¹ According to PWC late research, non-financial corporations, particularly in UK, France, and the USA increased their cash holdings in order to provide a buffer against liquidity constraints and survive another economic downturn. In a low-interest environment, businesses are expecting interest rate rise soon so they prepared to pay back higher debt cost or offset some borrowings in the future. The CNB (2016) points out that in financial sector anti-crisis measures such as the liquidity provision incentives hardly affect credit on the supply side, its efficiency is undermined by liquidity hoarding.

United Kingdom (UK) the bank rate was gradually cut down by Monetary Policy Committee (MPC) to its effective floor and reached the minimum of 0,5 % in March 2009. However, it has not had a positive impact on bringing confidence to the market and influence investors' behavior.

It was not possible for the central bank to stimulate the economy by further lowering the rate. So the BoE initiated a program of injecting precisely liquidity into the economy with an aim to foster demand, and thereby help to achieve the 2% inflation target.

Over the first successive rounds of policy implementation, the Bank bought assets, consisting mostly of medium- and long-term UK government securities (gilts) as well as corporate bonds, a bit later high-quality commercial paper.

According to Weale and Wieladek (2014) policymakers were explicit in structuring their purchases with the aim to buy primarily from institutional investors, such as life insurance companies and pension funds (ICPFs), who are the traditional holders of long-term gilts. The purchases represented nearly 14% of annual nominal GDP.

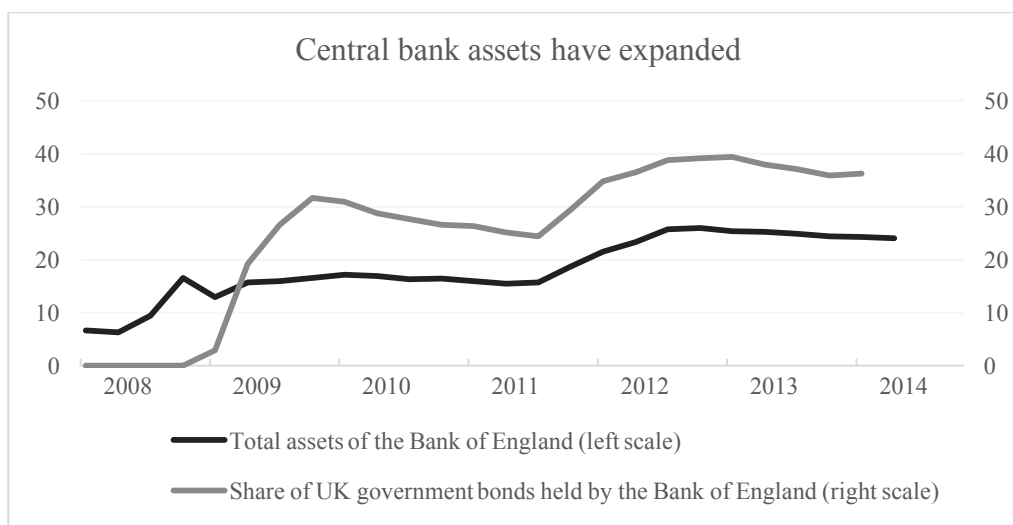


Figure 3 Bank of England assets and government bonds holdings
Source: The Bank of England

The *figure 3* shows how the BoE balance sheet has expanded since financial crisis almost by 20 percentage points of GDP. The largest share of purchasing program falls on gilts which are mainly held by the BoE. In the *table 1* below displayed the structure of total assets and the amount of outstanding stock of holdings by 2017.

<i>Gilt purchases</i>	£ 435 billion
<i>Corporate bond purchases</i>	£ 8 billion
<i>Loans made through the Term Funding Scheme</i>	£ 45 billion

Table 1 The Bank of England holdings of securities under Quantitative Easing
Source: Bank of England

All transactions have been financed by the creation of central bank reserves. Together with the *figure 3*, it represents the changes in a quantity of asset hold. The first QE, implemented in 2009, have brought BoE holdings of long-term securities, essentially gilts, to £375 billion (nearly 25% of GDP), increased to 40 % of GDP by 2013.

The QE may have lowered gilt yields by about 100 basis points and lifted real GDP by 1.5-2% and inflation by 0.75 to 1.5 percentage points (Joyce *et al.* 2011). Furthermore, the QE was extended many times.

In December 2009 the BoE announced that it would act as a seller, as well as a buyer, of corporate bonds in the secondary market – *so-called “credit easing”*. The aim was that the sellers would want to rebalance their portfolio using the new deposits (money). According to Joyce *et al.* (2011), the assets acquired by the BoE and money are imperfect substitutes: investors who sold assets to the central bank bought other long-term assets, pushing their prices up and yields down. This process consequently reduced borrowing costs allowing companies to raise the capital effectively.

In 2011 the QE is estimated to have lowered corporate bond yields by 75 basis points. Company profits benefitted from healthy demand and low financing costs, in addition to specific contributions from the financial and housing cycle. Evidently, the UK FTSE 100 Stock Market Index overcame the crisis in 2009, starting gaining the pace of growth from less than 4000 index points and reached an all-time high of 7428.47 in March of 2017.

The impact of policies on the banking sector

The world financial crisis revealed the existence of unstable large banks that could crash anytime, posing risk to the economy. The roots of it were in the undercapitalized banking sector, the problem of “too big to fail” has arisen during the recession. In order to prevent the collapse of the banking industry, on top of unconventional monetary policy, the Treasury provided direct cash support, which was at that time 10 % of GDP, and guarantees amounted to about 65% of

GDP. By 2014 the banks' off-balance sheet activities have fallen almost twice. According to OECD data, 40 % fall in stock prices will lead to \$ 300 billion capital shortage in UK and US.

To support lending the Government announced the Help to Buy program, which seemed to help increase demand and raise lending to households. Subsequently, house prices stepped-up, but even after this demand still exceeds historically low supply. On the contrary, net bank lending to companies remained weak even after launching Funding for Lending Scheme in 2012, which contributed to a cut in funding costs. The risk, that banks bear, is linked to international developments, such as the Euro area sovereign debt crisis. UK banks have limited direct exposures to the sovereign and bank debt of the most vulnerable European economies, but have bigger exposures to the non-bank private sectors of these economies.

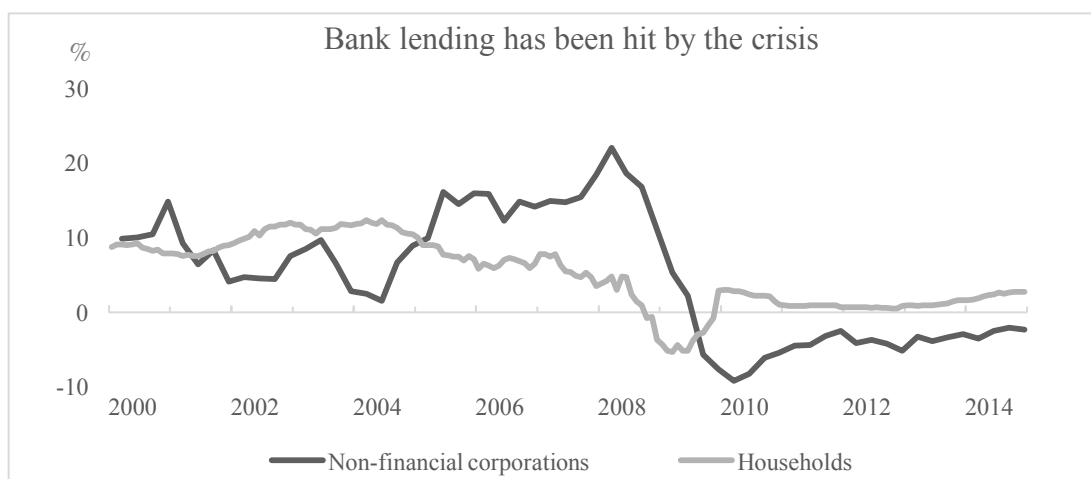


Figure 4 Bank lending to the private sector in the UK, 12-month growth rates
Source: OECD data

As previously was mentioned, banks in the UK cut back lending, making funding more difficult for small and mid-sized enterprises. The new opportunities of broadening access to finance were provided by alternative credit intermediaries: direct lending funds, peer to peer lending or equity-based crowdfunding. These forms are hard to regulate and supervise and could appear the risk increase of shadow banking. Still, the main challenges remain enhancing credit supply and financial stability.

OECD economic survey (2015) indicates recovery of UK economy from the financial crisis, saying that it has benefited from the impact of extensive domestic policies such as highly-accommodative monetary policy and measures that supported lending and revived the housing market. Also mentioning, employment has retrieved to its pre-crisis trend and is now (2015) at peak stage. And, what is important, measures of consumer and producer confidence improved.

Nevertheless, the expansive policy did not meet its target at some point due to exogenous factors. Inflationary pressures remained low owing to large spare capacity and falling commodity prices.

1.3. The European Union, banking sector's shortcomings

It is a fact that the market shocks in the USA spread uncertainty among investors and have led to the global downturn². Indeed, it just had given a push to the vulnerable economy of European countries to come through weak growth and low confidence. Essential transformation and significant structural reforms in different sectors were implemented in order to get the economy back on track, which suffered from the prolonged recession.

The European Union have its own internal imbalances, especially before crisis southern countries attained deep current-account deficit, while northern economies were prosperous and managed offset surplus. The last ones in future will become creditors to those who will incur the risk of default.

The European Central Bank (ECB) was needed to step in and stabilize the situation. Similar to USA and UK, the ECB had to react immediately to calm the market. It cut back the policy rate to 1 % till 2011 and announced ultimate liquidity provision with overnight maturity due to extraordinary strong demand of banks, and it gradually extended the average maturity by providing the proper refinancing operations. In early phases of the crisis, the ECB kept the overall supply of central bank liquidity unchanged by giving fewer amounts of credit at the end of each relevant period comparing to the beginning.

The leading role in a tremendous slump was given to unhealthy European banking sector. So the main target of the ECB policy was to prevent the collapse of big-league players. As it was mentioned, in Europe corporations mostly rely on bank lending, so this sector is large enough to put the whole economy in danger. Which is opposite to the US, where policy programs, conducted by the Federal Reserve, were directly intended to stabilize key financial markets by purchasing debt securities and giving the guarantee for them.

It is predictable that an effort to maintain positive course through monetary policy would increase gradually the ECB's balance sheet: on the asset side by covered bond purchase program which was paid back with liquidity. Also, demand for banknotes and coins increased that influenced volume of refinancing operations. Besides that, commercial banks

² Blanchard et al. (2017) see the reason of weak US demand growth in downward revisions of productivity growth.

independently determined the amount of liquidity needed, after that they left part of it in a special account, which means both sides of balance sheet were affected by an increase in deposit facility.

The speech of 2009 given by the member of the Executive Board of the ECB Jürgen Stark represents some effects of monetary policy during the recession: the excess liquidity did not stay in the market and did not influence inflation because it flowed back to the ECB via the deposit facility. Furthermore, this did not lead to a growth in credit and monetary aggregates but lowered money market rates and price of capital (see *figure 5*). However, credit flows remained weak (*figure 6*).

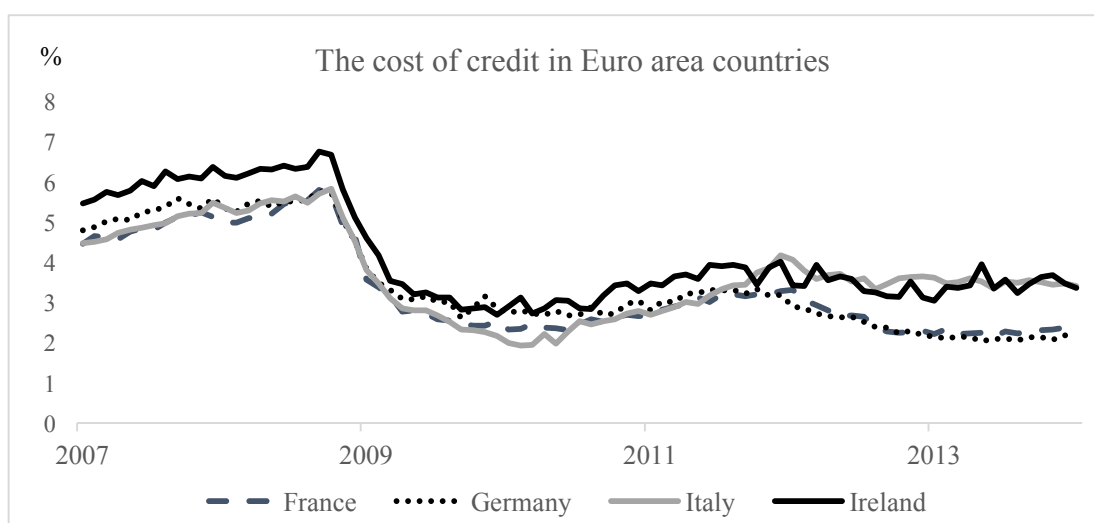


Figure 5 The cost of credit in Euro area countries
Source: OECD Economic Surveys: Euro Area 2014

As it showed in *figure 5*, before the crisis in different-performed economies the interest rates on new loans were considerably high, remained around 5 %. They dropped by 2 percent points, but this did not support lending and investments. Banks still struggle to give loans to households and small businesses, especially in worse-performing countries, where cutback indicates more than 30 percent points. Credit to households shrunk significantly comparing to the corporate one. As a result, the economic activity for a long period stays unsteady.

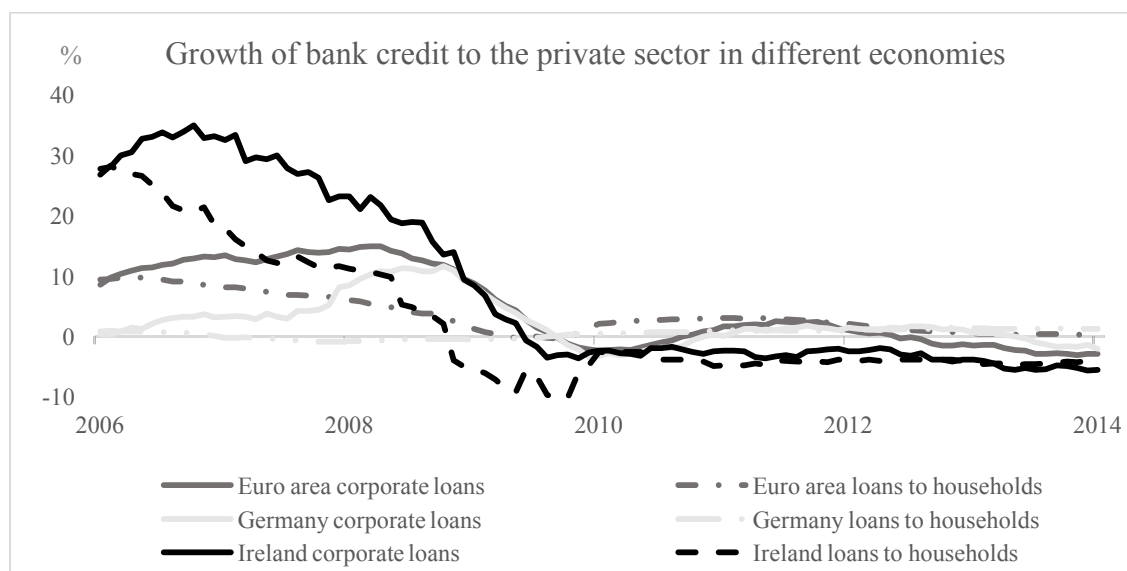


Figure 6 The growth of bank credit to the private sector

Source: OECD Economic Surveys: Euro Area 2014

In the Eurozone observed a strong link between banks, real economy and sovereigns. It is possible to assume, that the ECB' support in order to protect banks had a small effect because it underestimated their high exposure to sovereign risk.

European Sovereign Debt Crisis of 2009 – 2013

The default of Icelandic three major privately owned commercial banks caused a financial chain reaction. The assertion called “too big to fail” remains common. It was one of the presuppositions of impendent European Sovereign Debt Crisis of 2009. The other was the crash of overheated real estate market in several countries like Spain and Ireland, the shock spread over the entire industry. Also, it is important to mention that the attempt to adopt euro as a common currency could lead to economic deterioration of a Eurozone member if it is not suitable for the single economy.

Right after the crash in real estate market, a problem of the significant growing public and private sectors debt made refinancing of arrears difficult, the national credit ratings decreased. The fact that the European banks' assets consist of the significant amount of domestic government bonds questions solvency of their banking sector.

When the industry was on the edge of bankruptcy, countries decided to provide emergency financial assistance to banks and bondholders on a national level, turning private debt into public: buy-outs of losses and debts were indirectly financed by taxpayers. Nevertheless, it did not stop the oncoming crisis, governments of Greece, Spain, Portugal,

Cyprus, Ireland and Italy asked International Monetary Fund and the ECB for financial support in return for fiscal austerity plan and structural reforms.

The austerity policies, forced by the northern creditors in problematic economies, had a relatively negative impact on domestic demand. It could be seen as a reverse to accommodative monetary policy, that had supported the growth. The aim of restrictive fiscal policies of 2010 and 2011 was to cut back government spending and deficits, that were created by politicians during "political" business cycle, to put simply – elections, in order to influence voters. As well, it managed to keep countries' debt from rising. For example, currently, in Greece and Portugal, the government debt exceeds 170 % and 130 % respectively.

The consequences of austerity are ambiguous, on one side governments managed to cut state's budgets to stabilize public finances (*figure 7*), since 2010 they tried to reduce spending continuously from almost – 10 to – 5 % of GDP.

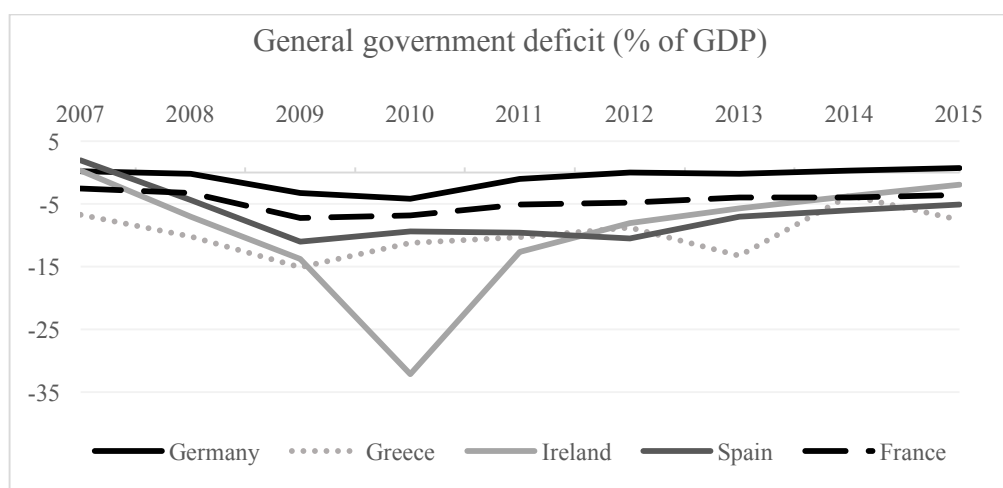


Figure 7 General government deficit
Source: OECD (2017)

Nevertheless, despite reductions, the government debt was steadily rising in Greece, Spain and France. In Ireland diminishes since 2013 (see *figure 8*). Also, the unemployment rate in Euro area reached a record level in 2013 of 12 % at some point due to cut down jobs in public and private sector primarily.

The austerity and indebtedness overall reduce spending and consumption, as a result, that slow down the growth and cut back private investments.

Some economists believe the roots of the prolonged crisis are in trade balance deficit, rapid deterioration of economic conditions, easy access to credit and growing bubble on real estate market.

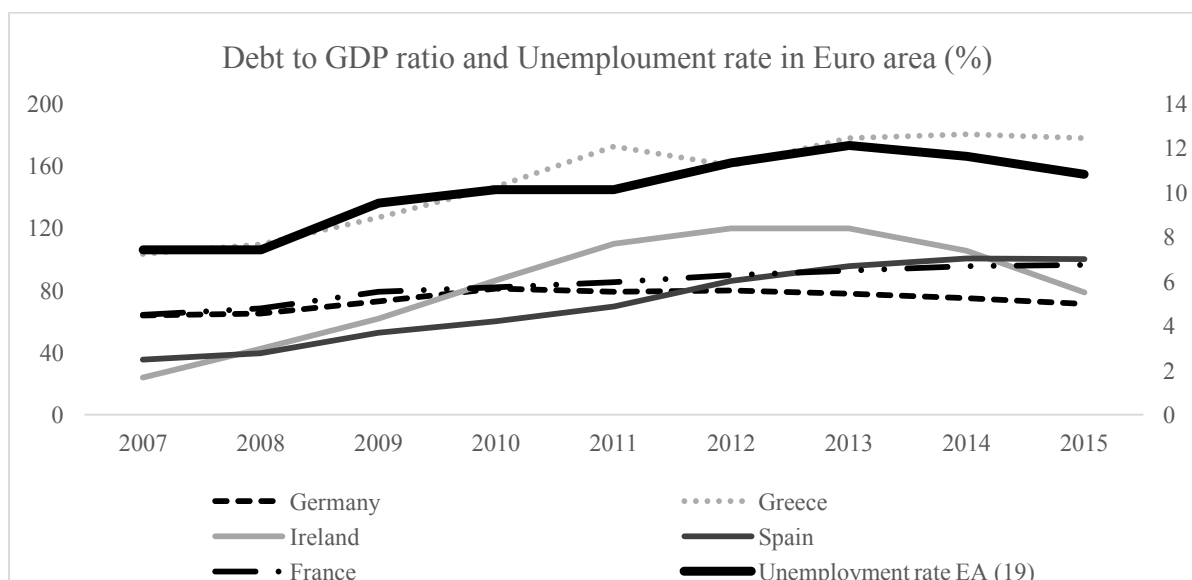


Figure 8 Unemployment rate in EU and Debt to GDP

*Comment: Debt to GDP ratio is represented on the left scale, the right scale represents the Euro area unemployment rate.
Source: OECD (2017)*

Problems in Eurozone appeared long ago before 2008. One of them is that a monetary union did not establish the banking union, as a result, there was no general approach to solving bank deposit insurance issues, no principles of complex supervision or common methods of banks' recapitalization or liquidation.

The regulation of financial risks prevents financial system security and gives protection to users of financial services (Cipra, T., 2015). The first Basel Capital Accord of 1998 was internationally implemented and had changed over time demanding new requirements such as capital adequacy (to cover future losses of banks or investment firms) and minimal capital requirements, the determined structure of regulation capital and other rules in order to carry out supervision of banking sector. In the EU the Basel II was implemented in the beginning of 2008, it takes into account market, credit and operational risks, but disregard the risk of liquidity. The crisis led to the understanding of the agreement's shortcomings and, as a result, later Basel III came with new rules, which should strength reliability and crisis resistance of banking sector.

According to Federal Reserve Board report (2016), nowadays some large Italian, Greek and Cypriot banks and the Deutsche Bank specifically still load up with bad non-performing loans and have the broad stock of toxic assets, so-called derivative financial instruments. Many banks, including Europeans, went through Supervisory stress testing, which is a forward-looking quantitative estimation of the impact of stressful economic and financial market conditions on bank capital. Comprehensive Capital Analysis confirms, that a potential fall of

any of these banks will cause new enormous damage not only to Germany but also to Europe and to the world. For many of them, as a few years ago, the ECB stays as a lender of last resort.

Implementation of Quantitative Easing

On 22th of January 2015, the European Central Bank announced an expanded asset purchase program. Weak and unstable macroeconomic development of Eurozone after sovereign debt crisis required a forceful monetary policy response. Bad economic conditions such as historically low inflation, high unemployment, slow GDP growth and negative real interest rates compelled the ECB to change policy methods and use unconventional instruments.

The essential ECB's strategy is determined by the price stability as a year-on-year increase in the Harmonized Index of Consumer Prices (HICP), the ECB aims to maintain inflation rates below, but close to, 2% over the medium term. Nevertheless, in order to fulfill its price stability mandate, the bank also had to support economic activity. To do so it included the purchase of sovereign bonds to its current private sector asset purchase programs.

Previously, in the end of 2014 the asset-backed securities purchase program (ABSPP) and the covered bond purchase program (CBPP3) were launched, and a few months later the ECB expand policy with asset purchases, which include bonds issued by the public (PSPP) and corporate sector (CSPP):

- 18 Euro-area central governments,
- European agencies,
- European institutions.

Together these three programs amounted € 60 billion of purchases each month and carried out in the secondary market. At the beginning, the ECB assumed to finish the QE in September 2016 and keep the volume at € 60 billion, however, the amount changed over time and was € 80 billion. Also, it was released at the end of the year 2016, the Governing Council decided to extend the program by an extra nine months until December 2017.

<i>Changes of holdings (€ mil.)</i>	<i>ABSPP</i>	<i>CBPP3</i>	<i>CSPP</i>	<i>PSPP</i>	<i>APP total</i>
<i>Monthly net purchases</i>	119,0	4,3	7,8	68,2	80,5
<i>Holdings February 2017</i>	23,5	212,6	67,3	1 394 205,0	1 697 592,0

Table 2 Asset purchase program
Source: the ECB, monetary policy

From the table 2 is evident, that the public sector purchase program (PSPP) is totalling around 82 % of all holdings, the PSPP represents:

- Nominal and inflation-linked central government bonds, bonds issued by recognized agencies, regional and local governments (90 %),
- international organizations and multilateral development banks located in the Euro area (10 %).

Mostly consist of Germany, France and Italy's debt securities, the exact amount was determined by the equity shares of member-countries in Eurosystem.

Another relatively significant component is the covered bond purchase program (CBPP3), which started in 2014 and include bonds, issued by credit institutions incorporated in the Euro area and had credit quality step 3.

The purpose is similar to the UK: institutions who sold securities can use the money to buy another asset and extend credit to the real economy, so that economy achieves medium term inflation rate close to 2%. On the other hand, commercial banks are the part of the business industry, they provide their activities in order to gain return at the risk they are able to bear. So, when a central bank tries to influence money supply via monetary policy operational channels (liquidity support, portfolio rebalancing, confidence/uncertainty), it relies on perfect and clear transmission mechanism that implies:

- Central bank's total control over monetary base,
- stability of money multiplier,
- stable/constant (predictive) velocity of money.

Because commercial banks only follow recommendations and the central bank cannot force them to provide certain operations, these assumptions were not met, as a result, the transmission mechanism did not work according to the quantitative theory of money. The possible reasons and consequences could be found in a size of monetary base multiplier and fluctuation of a velocity of money during the economic downturn.

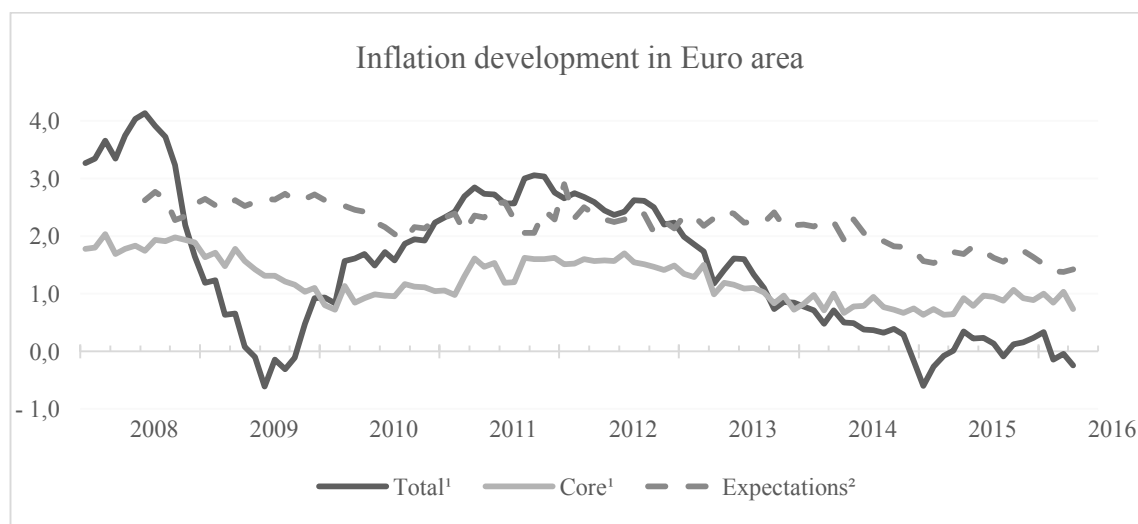


Figure 9 Harmonized indices of consumer prices in EU

Comment: 1. Harmonized indices of consumer prices; core inflation excludes energy, food, alcohol and tobacco.

2. Expected average annual inflation based on the difference between 5-year and 10-year inflation swaps.

Source: Eurostat (2016)

Also, even with the expansive monetary policy, the situation of deflation is observed between 2014 and 2016, the decline started in 2011 after the rapid downturn of 2008. In *figure 9* inflationary expectations are falling, but considerably above the current level. The QE was implemented when it became obvious that the European economy continually is on the way to deflation, which has a lot of negative consequences such as decreasing business and consumer confidence, that would affect output in general. Also, factors such as the significant drop in oil prices, strong euro before 2014 and cheaper imports mostly from China had a temporary negative effect. According to IMF (2016) these factors erodes the capacity of monetary policy, European policymakers in the economy need to boost demand and firm up expectations.

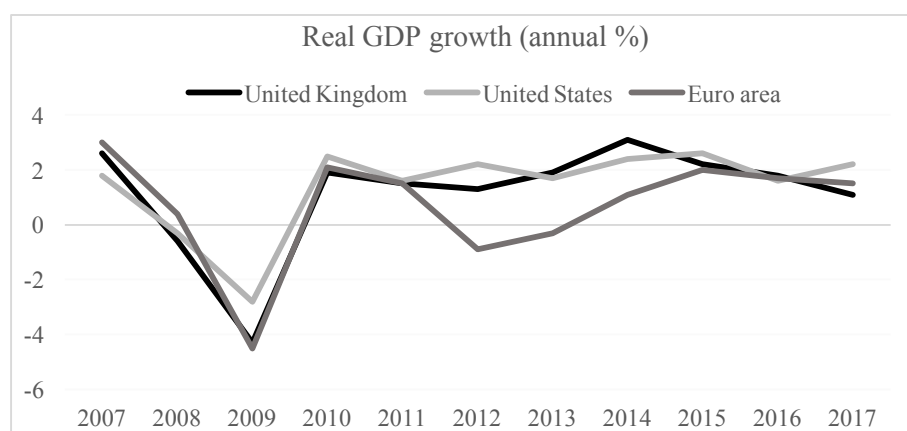


Figure 10 The growth of real GDP: UK, USA and Euro area

Source: International Monetary Fund, 2017

To conclude, after introducing additional large-scale asset purchase program "Quantitative Easing" more than two years ago, the GDP growth of Eurozone members remains

slow and unsteady, the growth stays under 2 % for a long time after financial crisis comparing to stable rate in USA and UK (*figure 10*). The belated ultra-expansive monetary policy could be unsuitable for diverse-performing economies within Euro area. It also can be explained by the historical differences between USA, UK and continental Europe economies structure. In Anglo-Saxon countries the financial sector is very strong comparing to European, as was mentioned, stock markets are highly developed. So that the portfolio rebalance channels, through which the QE worked in US and UK, had a direct impact and the policy was more effective. At the same time, the QE is very risky for the central bank in terms of significant losses when yields of bonds are already at a very low level.

Many countries of Eurozone are highly indebted and the unemployment rate is above 10 %. To get funding for corporations and households is very difficult, some commercial banks still suffer from non-performing loans and afraid to give new ones, trying to fulfil Basel III requirements and increase credit quality.

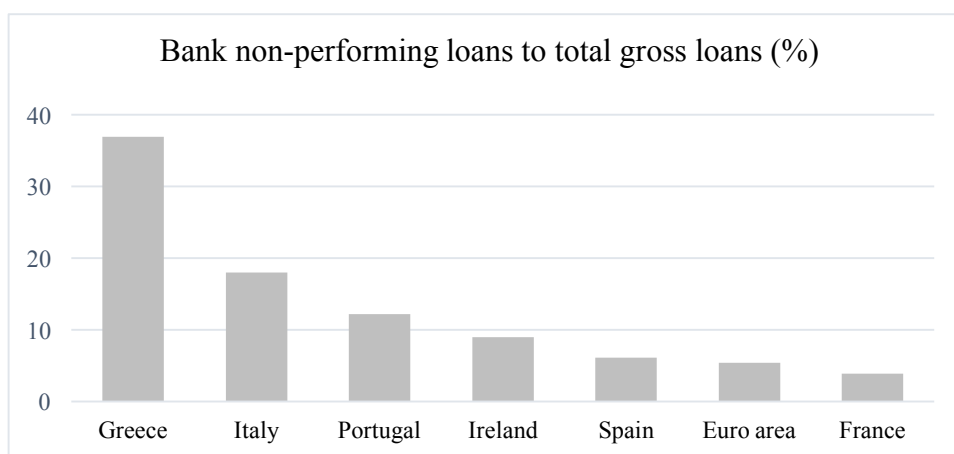


Figure 11 Bank nonperforming loans to total gross loans (%)
Source: World Bank, International Monetary Fund estimates, 2017

Almost 0 % interest rates do not help in rising investment activity, capital flows remain weak. Furthermore, the main target – the price stability – is not completed and the European economy is on the edge of deflation. According to IMF (2016), even if deflation is avoided for some time, the lower nominal interest rates would leave a small room for the central bank to ease further the monetary policy in future, that affect wages and provoke adverse demand shocks, which could lead to job losses because firms reduce costs. Also important, that monetary stimulus should comply with the corresponding expansive fiscal policy, which is hard to achieve due to the steady fiscal deficit. In indebted economy the deflation can bring many negative consequences: if prices fall the credit value stays the same which becomes difficult to pay it back.

For some time now economists around the world searching for a new concept, that will shift the economic growth to next level. Economic theories of the 20th century are broadly discussed again, especially regarding anti-deflationary policy; also, new tools are required to spur the growth in 2017. In 1969 economist Milton Friedman introduced the framework for helicopter money, which is very popular topic lately. It has reached the parliaments in Iceland, the United Kingdom, the Netherlands and Switzerland, where a referendum will be held on the matter.

2. The Helicopter Money

It is reasonable to mention, as the concept of Helicopter Money has not been applied in real long enough yet to indicate its real potential and therefore, this section is based on information and assumptions given by economists. Furthermore, besides of the question of its economic effect, there is also a political as well as a psychological dimension in the hypothetical application of Helicopter Money, which makes it very hard to predict the potential of this concept. Nevertheless, this paper will only focus on the economic dimension.

Milton Friedman (1969) defines Helicopter Money in his paper as follows “*Let us suppose now that one day a helicopter flies over this community and drops an additional \$1’000 in bills from the sky. [...] Let us suppose further that everyone is convinced that this is a unique event which will never be repeated*”.

In a situation when the central bank completely controls the monetary base, its fluctuations directly influence real economy. However, not only in Euro area, an impact of central bank policy is dependent on commercial banks’ actions, strategy as well as on trust of households and businesses.

The ‘money drop’ proposes a permanent increase in the nominal stock of fiat base money at lowest nominal interest rates, which respects the intertemporal budget constraint of the consolidated Central Bank and fiscal authority (Buiter, 2014). Some experts argue that the free distribution of Helicopter Money to the private sector would increase consumption and investments, and help to spur the Euro area economy during deflationary periods.

Friedman states that a further increase in the monetary base by Helicopter Money would necessarily increase spending (stimulate aggregate nominal expenditure), and end the deflationary slump which is a current issue. Such an improvement in private consumption would positively affect real GDP, causing the multiplier effect.

If the economy is open, the mechanism relies on the behaviour of the financial sector and non-financial businesses, that drives investments, production and labor demand, on supply side it counts on subjects of the rest of economy and world economy. Buiter (2014) points out the matter of the specification and structure of economy model saying that such Helicopter Money drops variously change asset prices, interest rates, goods and services prices, wages and/or output and employment.

2.1. The difference between Quantitative Easing and Helicopter Money

Both approaches belong to the group of unconventional instruments intended to influence economic activity and support economic growth. However, there is a structural difference in methods of policy implementation that in the end has a diverse macroeconomic impact. These policies carried out under the condition that interest rates are at their zero lower bound.

For example, the money created by QE are redeemable on one side, which means it can be taken out of the system if needed by selling purchased assets, and viewed as a liability by the holder on the other side, meaning central bank has to pay it back. On the contrary, the Helicopter Money (HM) is a permanent/irreversible increase in the stock of fiat base money.

	Starting position			
Assets	Government bonds and other assets			
Liabilities	Banknotes	Reserves	Capital	
	Quantitative Easing			
Assets	Government bonds and other assets			Newly purchased government bonds
Liabilities	Banknotes	Reserves	Capital	Newly created reserves
	Helicopter Money			
Assets	Government bonds and other assets			Destroyed government bonds
Liabilities	Banknotes	Reserves	Newly created reserves	deleted capital

Figure 12 The Central Bank balance sheet

Source: Data adapted by EPRS

Quantitative Easing creates reserves by doing securities purchases, that leads to expansion of central bank balance sheet. According to Karakas (2016), in order to make the monetary stimulus permanent, the central bank has to cancel the newly purchased government securities. However, if sovereign bond-financed tax cuts or higher public spending do not step up the economic activity and the aggregate demand remains unchanged, the effects of helicopter money may be canceled out.

2.2. The implementation of Helicopter Money

Bernanke (2016) determines Helicopter Money channels through which it would stimulate demand:

1. the increase in household income, which should promote greater consumer spending in case money drop takes the form of a direct transfer;
2. a temporary hike in expected inflation as a result of the increase in the money supply,

- which in turn should stimulate spending;
3. the direct effects of the public works spending on GDP, jobs, and income in case of government spending is financed by money creation;
 4. money-financed fiscal programs do not increase future tax burdens and so should provide a greater impulse to private spending than expansionary fiscal policy financed by government debt.

There are rather direct and indirect approaches to implementing such a policy. The first method is characterized by the money injection to private households increasing their disposable income or level equity of businesses. A number of bills should be estimated regarding the level of consumer indebtedness, marginal propensity to consume, saving rate. In the end, all these factors will influence higher level of GDP and have a positive macroeconomic effect.

Indeed, EPRS (2016) indicate that Helicopter Money could stimulate aggregate demand and increase the inflation rate, assuming that economic subjects actually spend the money received for real economic expenditures instead of saving it in the favor of future consumption or tax increase.

The latter finding shows that a helicopter drop transfer via the central bank will be more effective than a transfer via the government. Muellbauer (2014) suggests that there is a considerable difference between the ECB doing a €500 per-adult hand-out as part of monetary policy and governments doing this as fiscal policy. Because apprehensions of economists always stay consistent regarding politicians over-spending during ‘political’ business cycle and as a result running excessive government deficits.

As a matter of fact, the Ricardian equivalence theory suggests that if a government tries to stimulate demand financed with ongoing debt, the demand would not change because public await paying out the debt in the future by the tax increase. Not to make negative scenario happen, the government should ensure stability of its future fiscal policy and persuade people that the money they got will not be exact.

So, an indirect approach is defined by the financing of government fiscal expenditures by the central bank in order to provide the government with cash to stimulate economic growth. This approach is highly favorable for governments suffering from a continuous budget deficit, that had to be cut by unpopular fiscal and structural reforms. There are three possibilities the Helicopter Money can be implemented: the government can increase government spending and investments, distribute money directly to the citizens, or relief tax regime for the private sector.

Karakas, C. (2016) states that according to some empirical studies in certain countries tax rebates have had positive macroeconomic effects.

Afterward, through the corresponding increase in government expenditure, according to Mankiw and Taylor (2012), the national income would increase what in turn would lead to an increase in the overall production. By doing so, the government could benefit from the multiplier effect arising from an aggregated demand based on an increased marginal propensity to consume (MPC). It is very important that such an investment will focus on improvement in the production cycle, build an advanced infrastructure, create new jobs in developing competitive industries, support R&D projects that will have a positive outcome in a long run. The policy implementation also highly dependent on the level of bureaucracy and corruption, and the stage of country's 'political' business cycle it is currently in. At the same time, it is strictly forbidden to monetize government debt, or directly finance public expenditure.

2.3. Advantages and disadvantages

One main advantage of Helicopter Money is its potential effectiveness comparing to the Quantitative Easing. Through selling, and repurchasing of bonds and other assets the QE tries to manipulate interest rates, rather than the HM directly influence consumer's behavior. Supporters of HM argue that it will boost demand, even if existing government debt is already high and/or interest rates are zero or negative (Bernanke, 2016).

As Muellbauer (2014) points out that "between 40 and 60 percent of a surprise transfer of €500 would be spent fairly quickly." He also argues that this percentage will depend on the net asset position of households. Particularly, liquidity constrained households tend to have higher propensities to consume in response to income shocks (Jappelli and Pistaferri, 2010). The money drop will cause the larger effect in Spain, Portugal, and Greece, where many households are perhaps more liquidity-constrained rather than in Germany, where many households already have a lot in their saving accounts.

Rooij and Haan's study asserts that the amount of transfer also affects the final spending: bigger it is – less it is going to be actually spent. *'As households are currently highly leveraged in several countries in the Euro area, they might decide to use the money received to improve their net asset position'*. However, lower policy rates alter into lower deposit rates; this reduces total household spending which can be encouraged by money provision.

Rogers (2016) specifies the government money-financed fiscal policy will further lead to an increase in income, employment, and the GDP growth whether Helicopter Money is fairly

and widely distributed to industries or citizens. Also, The Helicopter Money implementation does not in any way trigger an increase in taxes.

By referring to Wren-Lewis (2015), Helicopter Money in future could lead to an excess inflation that is not controllable because the policy is irreversible, it only can be abolished if effects are negative. To argue that assertion the Quantitative theory of Money should be understood at present economic conditions.

The quantitative theory of money

Assuming that the European Central Bank or the Federal Reserve relied on perfect transmission mechanism, the QE would lead to a hyperinflation very fast, but it did not happen as a velocity of money and money multiplier decrease during recession because economic entities tend to save more and held liquid assets and commercial banks held excess reserves (see the text below). The liquidity risk appeared to be initial issue during recession when many big banks failed or faced insolvency problem. So the money creation needs to be postponed from commercial banks to central bank, because in the modern economy commercial banks create 97 % of broad money, in the form of bank deposits, by making new loans and central bank cannot command/determine banks' business strategy (McLeay, M. et al. 2014).

The Helicopter Money is not created by the debt and will not expose the risk of default if they are distributed directly to the citizens or via public finance leaving aside unhealthy banking sector. If central bank implements such a policy by placing money on commercial banks deposits, the Money supposedly enters circulation through bank lending to households and businesses, turning the system into the downward spiral of new default loans, because over time financing cost becomes unbearable. Economic essential conditions were not changed in terms of new jobs creation or improvement in business environment. Ineffective funds allocation cause default on the loans, that would lead to new bank recapitalizations by government, which has to tighten fiscal policy by increasing taxes and cutting expenditures. As a result, it would lead again to the stagnation of the economic system.

Diminishing effect of expansion of monetary base due to money multiplier is another reason for putting money creation under central bank control.

$$M * V = P * Y \quad (1)$$

$$MB * (1 + c)/(r + e + c) * V = P * Y \quad (2)$$

- c is the proportion of their money customers keep as cash rather than in the bank (i.e. c is the currency-(demand)deposits ratio),

- r is the reserve requirement,
- e is the reserves banks keep in addition to the reserve requirement.

The money multiplier $(1 + c)/(r + e + c)$ should be stable over time and its changes are predictable. If the money multiplier is below 1, especially during unstable economic development, in a short run monetary base expansion hardly change price level or real GDP growth, at the same time fixed prices such as wages are not flexible in a real economy. Avoiding banking sector channels, money creation under central bank control would stimulate shortening negative output gap and affect flexible prices.

Another argument in favor of Helicopter Money is a “carry trade” behavior of commercial banks in Eurozone. Since 2010 yield spreads of GIPSI (Greece, Ireland, Portugal, Spain and Italy) sovereign bonds began to widen, as a result, risk neutral banks have actually increased their exposure to these countries by investing in that type of assets. Banks financed purchases with short-term debt, they enlarge investments when governments needed to extend term on outstanding debt (Acharya and Steffen, 2013; Ongena et al. 2016).

As the European debt crisis deepened, engaged in carry trade banks partly lost market value. According to Uhlig (2013), portfolio strategies such as shifting towards domestic sovereign bonds, particularly in troubled countries, enable banks and sovereign regulators to transfer some of the sovereign default risks onto the central bank. The moral hazard of banking sector is very dangerous for economy itself because commercial banks understand that in case of default they will be protected by the state authorities. Not to trigger systemic collapse, the government keeps on providing guarantees and history demonstrate that very few responsible persons had been prosecuted for fraudulent practices or insufficient control, that engender financial crisis.

2.4. Helicopter Money potential, application of macroeconomic models

The aim of this section is to identify and highlight potential effects of Helicopter money policy application but also to shade light on the disadvantages of its application. The economic analysis provided in this paper are based on the opinions and models of different economists and assumptions are made in accordance with macroeconomic theory.

The Market for Goods and Services and the Money market

The shifts in a market for goods and services (left panel) and a money market (right panel) are affected by expansive monetary and fiscal policies in a short run (*figure 13*). The increase of money supply moves M/P curve to the right, followed by a slight decrease in the

interest rate³. It reduces cost of borrowing and the return to saving, households supposedly buy more houses and firms invest in new factories or equipment. Nevertheless, households and businesses can allocate this money by buying another financial asset. The interest rate in the Euro area for a long time is at a very low level, which does not have positive feedback as investment activity is very weak because of investment trap. It is useful at this point to influence investment environment by *supporting fiscal policy* – government purchases.

In the left panel, the 45° line represents all points where national income equals consumption spending. Helicopter Money is an exogenous factor in this model, and the price level stays fixed as well as the interest rate does not change when income rises. Also, Mankiw and Taylor (2012) note that this line equivalent to the capacity of economy – aggregate supply curve.

Assume, that Helicopter Money granted to the government, in turn, the overall economic expenditure increases from E to E' . The same would apply if citizens would receive a money drop directly from the central bank. Instead of government expenditure rising (G), the consumption (C) would rise, given that the consumers spend that money. The effect from households' spending could be less expressed due to *the level of marginal propensity to consume (MPC)*. The higher MPC the greater the multiplier effect.

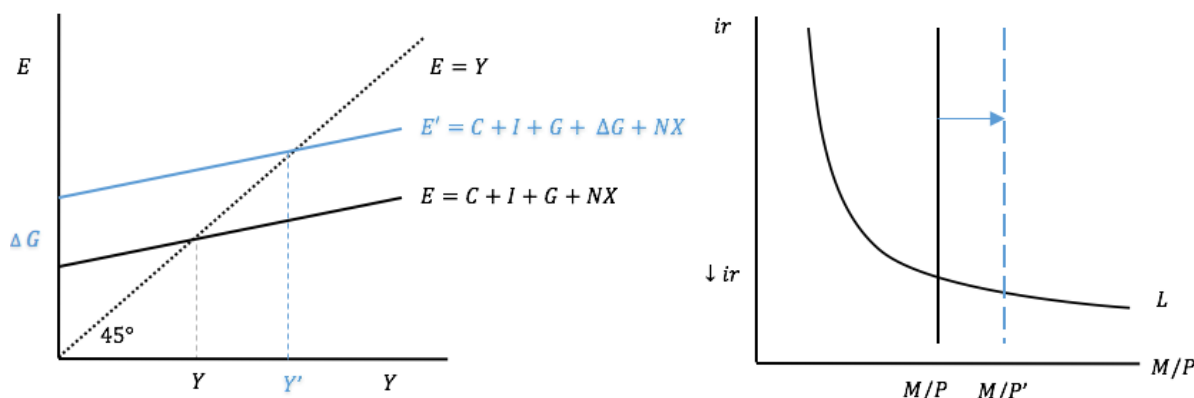


Figure 13 The government expenditure increases, supported by money supply shift

Source: This model was self-derived by the student developing this paper

Also, it is vital to note that actual government purchases, comparing to the effect of cutting taxes, would have larger immediate impact on aggregate demand for goods and services because it increases income and thereby stimulate consumer spending. Furthermore, Mankiw and Taylor (2012) imply that the higher government demand over time has repercussions. It raises employment and, for example, construction companies' profits, accelerates rise in

³ Increase of M/P stimulate increase in output (Y), as a result, it has an effect on the money demand (L) and economic activity which brings ir to the initial state. In a long run the price level rise, but the real output will not change (*Quantitative theory of money*).

investment (I). In a short run, the national income (Y) moves to a new level Y' as a result of complementary monetary and fiscal policy interaction.

The money market and goods market are linked with interest rate factor. Economist John Hicks developed theory based on Keynes' analysis that explains the links between the two. The framework for analysis of changes in fiscal and monetary policy is known as a IS-LM model.

The IS-LM model

IS-LM describes equilibrium in two markets at a particular interest rate, at fixed price level and determines general equilibrium in the economy in a short run. On IS-LM model the interaction between the fiscal and monetary policies (expansive/restrictive) can be shown. IS stands for Investment and Saving and shows the relationship between interest rate (ir) and output (Y) in the goods market⁴. The slope of IS depends on a responsiveness of C and I to changes in interest rate: the more responsive they are, the flatter the IS curve.

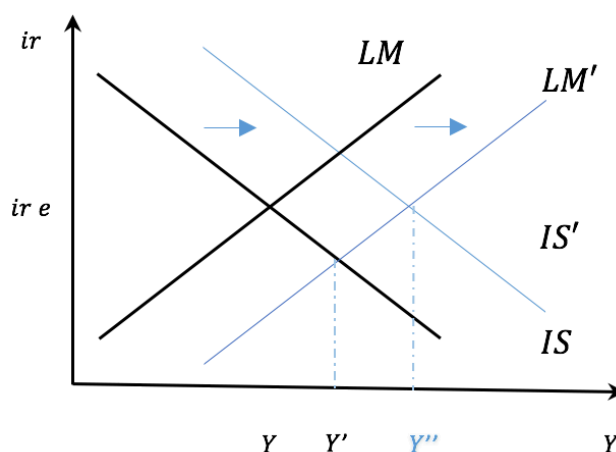


Figure 14 The IS-LM model

Source: This model was self-derived by the student developing this paper

Eurozone is currently in a liquidity trap which means that interest rate is near zero and the present monetary policy has a little effect on stimulating aggregate demand. So, one of this new stimulus can be Helicopter Money that shifts the IS and LM curves.

LM represents Liquidity and Money, it has a positive slope showing that it will depend on responsiveness of the demand for money to changes in interest rate. The LM curve can shift if central bank expands or contracts the money supply. When central bank increases the money supply, the LM curve shifts to the right establishing new equilibrium at a lower rate and higher level of national income (Y').

⁴ It also represents a situation in a credit market: a horizontal axis is savings and investments; a vertical axis is the interest rate.

The situation in *figure 14* shows that the government purchases supported with Helicopter Money could move the IS curve toward IS' which triggers a slight increase of the interest rate maintaining ir_e at constant level. As a result, the increase of the government expenditure, as well as consumption level, would lead to an increase of the output from Y' to Y'' , showing a new short-run equilibrium of the economy changes and determines a new level of output. To see the impact of Helicopter Money on aggregate demand the AD-AS model will be introduced.

The AD-AS model

Furthermore, the analysis of fluctuations in the economy as a whole can be shown with the model of aggregate demand (AD) and aggregate supply (AS); it focuses on two variables: output of goods and services measured by the real GDP and the overall price level between the periods t a $t-1$ (P , nominal variable), as measured by the *CPI*:

$$CPI = \frac{P_t - P_{t-1}}{P_{t-1}} \quad (3)$$

It is useful to recall that the GDP (Y) conclude four components:

$$Y = C + I + G + NX \quad (4)$$

All of them contribute to the AD for goods and services. Consumption and Investment depend on economic conditions, in particular, on the price level and interest rate, Net Exports are affected by exchange rate. Government purchases are the most direct way to influence aggregate demand.

When the crash in the stock market stroke the economic activity in many countries, it was followed by the recession that can be defined as a period of falling incomes and rising unemployment; the economy moved aggregate demand leftward, which means fall in output. Authorities all over the world tried to stimulate demand which still nowadays remains weak, as a result, global trade development slows down. Economies in Euro area marked as being under their potential, which appeared to be a negative output gap (see *figure 15*).

The output gap is narrowing in different countries for the past three years, but the actual long-term growth is questionable due to the fact that short-term investments and other stimuluses give only a temporary effect and expire after some time bringing back a wave of vulnerability.

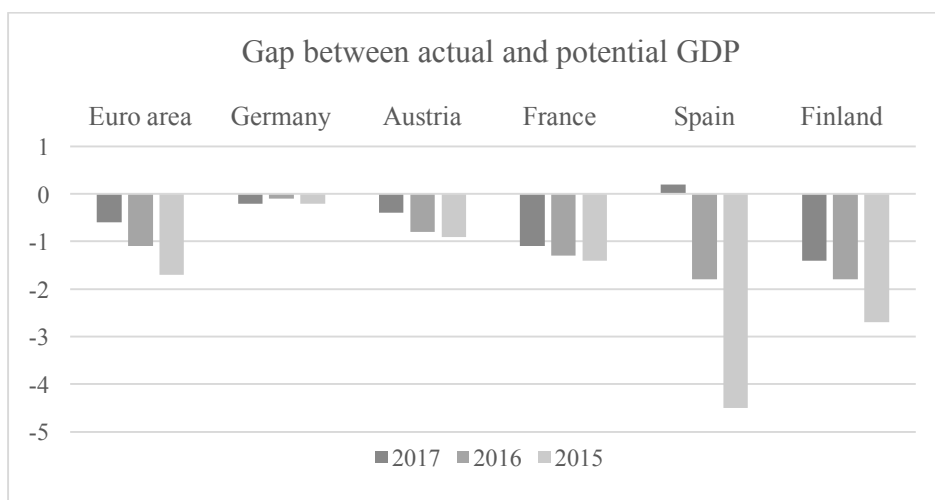


Figure 15 Output gap in Euro area (% of potential GDP)

Source: AMECO, retrieved 11.05.2017

In order to offset the initial downward shift in AD, the policymakers have to act sufficiently in accordance with level of downturn and wave of pessimism. As the QE in the Euro area shows weak influence on economic activity, the Helicopter money could have greater impact on aggregate demand:

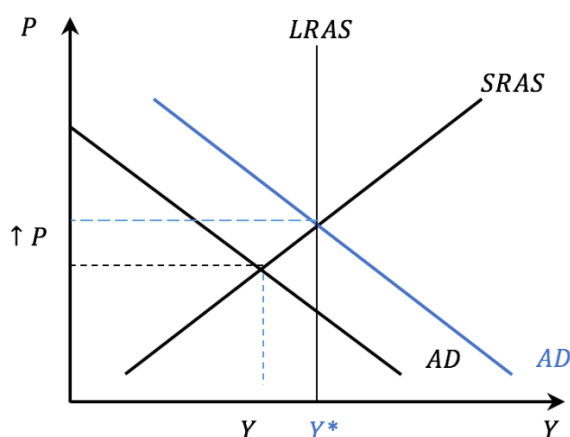


Figure 16 AD-AS model

Source: This model was self-derived by the student developing this paper

As was noted earlier, an increase in government expenditures or an increase in money supply (if the monetary policy is effective) would increase the number of goods and services demanded at any price. If government spends given money on building or developing infrastructure such as investments in roads, education, innovation, or in the creation of new jobs, there will be an increase in the aggregated demand, which leads to a right shift of the AD curve and shortens the output gap. The economy returns to its natural rate.

The productivity of a country's economy depends on its ability to deploy production factors such as work, capital, and the available technology. This implies that the AS curve in the long-term is vertical what represents the equilibrium of the economy and full employment

where wages, prices and perceptions will have adjust. Speaking of wages, nominal wages adjust slowly over time in response to changing economic conditions, so fixed prices, as well as wages, may be sticky in a short-term, on the contrary, money supply expansion influences interest rates, flexible prices, reduces unemployment and increases output. *The money neutrality* is the reason why nominal variables (the price level and the money supply) cannot influence real variable such as real GDP, unemployment, the real interest rate in a long run.

The LRAS curve shows the output level in an economy when all production factors (land, labor, capital and *technology resources*) are fully utilized. The long-term production level can be shifted – besides other things (see the next paragraph) – by direct government policy aimed at development of these factors.

According to Mankiw and Taylor (2012), the shift arising from labor is defined as an extensive way of increasing the natural rate of output by bringing greater number of workers into economy (immigration shock). Another approach says the alteration of capital stock (physical or human capital) influence productivity and the quantity of goods supplied. Also, production depends on natural resources available in the economy, so the discovery of new mineral deposits shifts the LRAS curve to the right. The global trade plays not the last role in resource supply. Perhaps, the *technological knowledge* (progress) is the most important factor that moves production process to the new level.

The economic growth is not something that could be achieved within months or few years, this process takes *decades* and requires huge amount of *properly allocated resources* and purposeful program. Country members of the Euro area face investments fall, elevated uncertainty and protracted weak demand which trigger off a weak productivity and bleak income prospects. A slowing technology diffusion partly reflects an aging workforce, slowing global trade and weaker human capital accumulation (Furceri, D. et al. 2017).

In order to make a long lasting improvement, the Helicopter money should be invested wisely focusing on significant changes in total factor productivity. In the 1950s and 1960s, economist Robert Solow developed a theory of economic growth where analyses the role of saving, population growth and technological progress.

The Solow model

The single most important determinant of the economic well-being of citizens is a long-run economic growth. The growth of standards of living depends on how much a nation saves and invest, overall improvement must be a primary aim of public policy. And, in order to achieve a rapid persistent growth, the Solow model emphasizes and analyze factors inducing it.

The $f(k)$ curve in *figure 17* expresses production function, so the allocation of output at any value of k between consumption and saving is determined by the saving (investment) rate. The function $sf(k)$ stands for the investment per worker as a function of the capital stock per worker. Investment applies for the expenditures of new equipment or plant. Before k^* , the investment exceeds depreciation δk , over time it will lead to increase in capital stock along with output $f(k)$ reaching *steady-state* level of capital per worker k^* (investment equals depreciation)⁵.

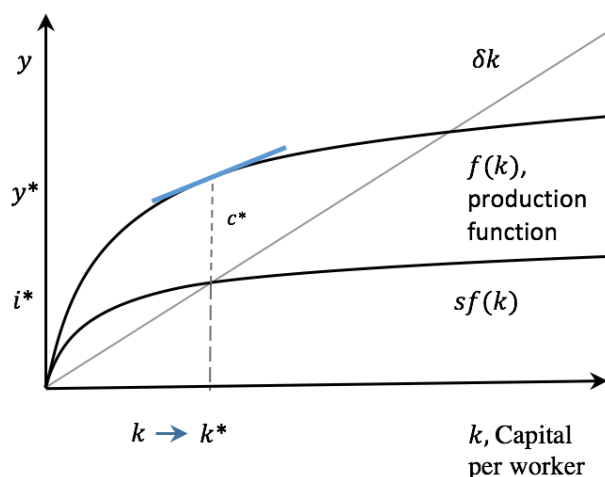


Figure 17 The Solow model, finding steady-state

Source: This model was self-derived by the student developing this paper

At the same time, the policy makers' goal is to maximize well-being of society and, for that reason they have to identify what level of steady-state is ideal, so they choose *the highest level of consumption and the right saving rate/optimal level of investment* (the Golden Rule).

The rate of saving in economy determines the size of capital stock and level of production, but saving by itself cannot generate persistent economic growth. Higher savings gain rapid growth, but only temporarily.

As the Solow model analyses factors that influence development in a long run, for that reason, the population growth has to be taken into consideration. Some countries are poor other are rich, the effect of an increase of population growth rate (n) is only seen as change in slope of $(\delta + n)k$. For some time, economy will move toward new steady-state to the left, and when it reaches steady state, an output per worker stops growing, with the population growth the output even diminishes. According to the Solow model, the higher rate of population growth, the lower capital per worker and output per worker.

⁵ When the population growth is taken into account, the model should be transformed using the population growth rate (n), so the line δk changes to $(\delta + n) * k$.

In order to complete the model, the technological progress should be included as a key component. The efficiency of labor reflects society's ability and knowledge about production methods, as a result, it rises as technology becomes available/affordable. The industrial revolution in England transformed manufacturing, the introduction of new methods improved productivity. Later, a computerization evolved production process, for example, reducing transaction costs. Advancement in education, health and skills of the labor force also have an impact on efficiency.

The OECD measure *multifactor productivity* of country members, that indicate the efficiency of production process where labor and capital inputs are used. The volatility can be explained by changes in management practices, organizational change, general knowledge, network effects, spillovers from production factors, economies of scale and etc.

In *figure 18* the indicator of productivity shows, how rapidly the index in Sweden, France, and Germany increased since financial crisis, and now it continues to grow. On the other hand, the countries, that experienced deep downturn and faced huge budget deficit, reflect almost no growth in productivity. According to OECD data, Spain, Portugal, Italy and Ireland are continuously decreasing their investment in infrastructure, which was less than 0,5 % of GDP in 2014. Also, living standards differ in Eurozone countries, which derived from a number of public investments.

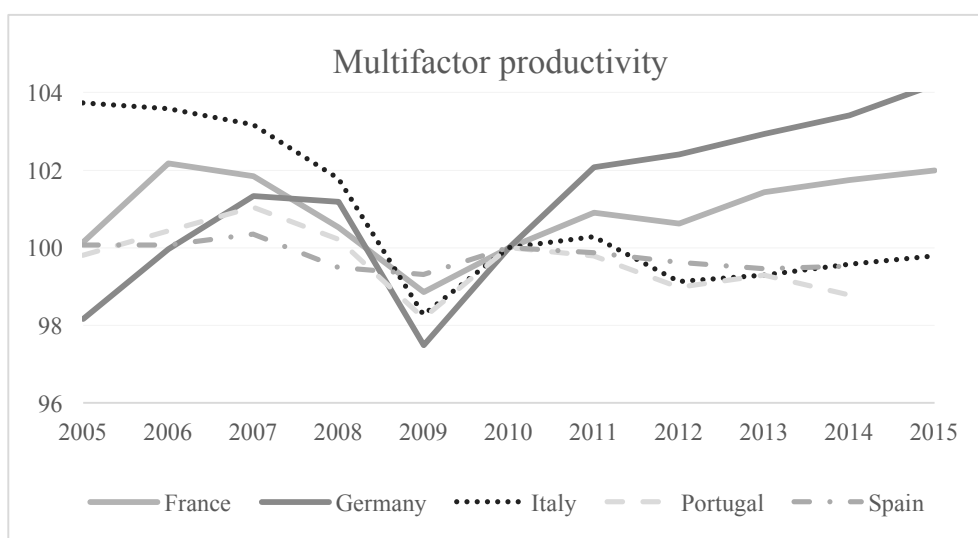


Figure 18 Multifactor productivity (indexes) of chosen Euro area countries
Source: OECD (2017)

As long as the GDP growth in several Euro area countries remains weak, the theory suggests some incentive approaches to reach steady-state k^{**} (growth of well-being of society). As was mentioned previously, population growth has limited impact and after effect is expired,

capital per worker decreases. In order to move economy to higher level in a long-term, adaptation of technological progress (g) is required.

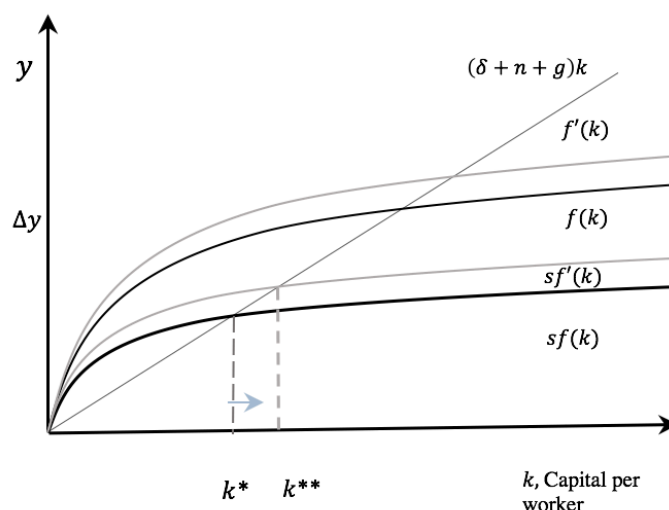


Figure 19 The Solow model with technological progress

Source: This model was self-derived by the student developing this paper

The Helicopter money can support the creation of nation's wealth if government encourages research and development (R&D) projects. The incentives for firms engaged in R&D help substantive increase capital accumulation, which will be continuous, changing steady state (from k^* to k^{**}) as long as the technological progress evolves. The increase in total factor productivity will be achieved if investment aids education, technological developments or training. This leads to boost in output because capital becomes more productive moving production function upward (*figure 19*).

Mankiw and Taylor (2012) indicate policies to promote growth:

1. Changing the saving rate.

The government can directly affect national saving through public saving. A budget deficit represents negative public savings, which reduces capital stock and becomes a part of the burden of national debt on future generation. Another approach suggests that government can influence private saving by changing tax regime.

2. Allocation of economy's investment.

Recent research on economic growth emphasizes that human capital is important as physical capital in explaining differences in standards of living. At the present time banks determine how capital will be allocated giving priority to the loans for households (buy property or other goods). The government must identify what type of capital is the most needed, so the

investment allocation is effective. The potential objects of these investments were introduced in the paper.

3. Establishing the right institutions.

The role of institutions is significant in different cultures that determine how effectively society allocates scarce resources making production process possible. There are legal traditions (law-system), quality of government, state authorities, all of them ensure the stability of the system and protection of citizens. La Porta et al. (1998) states that nations with developed capital markets allocate national capital more efficiently because it is easier for small and start-up businesses to finance investment projects.

Good governance, lack of corruption, an optimal allocation of human capital, and high social capital are all important in boosting the total factor productivity. Wealthy nations on a path of continual growth, because they learn how to adapt/apply new advanced technologies.

How to achieve a *sustained growth*? In a modern society state authorities also face environmental issues coming with the expansion of world production. Challenges as resource depletion and pollution, poverty, and others have to be understood and taken into future policy consideration.

Conclusion

The results of this paper are limited due to the fact that the approach of Helicopter Money has never been applied in practice. Therefore, the facts and information provided in this paper are based on the opinions and models of different economists. However, besides of the question of its economic effect, there is also a political as well as a psychological dimension in the hypothetical application of Helicopter Money which makes it very hard to predict the potential of Helicopter Money for Eurozone.

Many members of Euro area have a large and inefficient public sector, face low productivity as well as high unemployment rate, especially among the young generation. The high government debt does not allow finance and support an economic growth with the government expenditures only without negatively affecting other economic aggregates. Also, the data demonstrates that QE has a limited impact on GDP and inflation as it was expected. Such a policy implementation took place in the USA and the UK, the effect of it was positive due to the economies structure, where the QE channels works perfectly with capital market involvement bringing confidence to investors and achieving new output levels. In Eurozone reliance on banking sector makes the effect of monetary stimulus diminish.

In comparison, most scientists and economists agree that the implementation of Helicopter Money could have a positive effect on the economy and can help to boost consumption, improve the inflation rate and increase a countries' GDP. However, various authors also agree that there is a potential risk that Helicopter Money could fail at boosting a nation's economy or even lead to a hyperinflation in the worst case if the transmission mechanism runs faultlessly.

Furthermore, in order for Helicopter Money to reach the desired effect, citizens need to understand that the money invested in the economy is nonrecurring. Given that understanding, citizens would increase their consumption and therefore improve and increase the GDP. However, if that understanding is non-existent, citizens would hoard that money, and Helicopter Money would not have any influence on the economy or possibly aggregate a weak performance.

Nevertheless, the author of this paper sees a *high potential* for Helicopter Money in terms of Euro area in its current state if a money drop is supported with a reciprocal fiscal policy. As in many Eurozone countries the output gap still exists, *in a short-term* a wise fiscal stimulus stimulates aggregate demand bringing real output to its natural level. In addition, if the governments or citizens actually invest this money in projects, that bring significant innovation

or transformation, the Helicopter money also will have a positive impact *in a long run* on productivity – one determinant of sustainable economic growth.

At the present time some Eurozone members face a weak economic growth, falling investment rates and low competitiveness. However, it could be possible to influence economic growth by providing structural reforms and pursue *complementary monetary and fiscal policies*.

Terms and definitions

Austerity is a set of economic policies imposed on economies such as: cutting the state's budget to stabilize public finances, restore competitiveness through wage cuts and create better investment expectations by lowering future tax burdens.

Basel III is a comprehensive set of reform measures, developed by the Basel Committee on Banking Supervision, to strengthen the regulation, supervision and risk management of the banking sector.

Broad money is a measure of the total amount of money held by households and companies in the economy (usually measured as M2 or M3).

Deposit facility is a standing facility of the Eurosystem which counterparties may use to make overnight deposits at a national central bank. Such deposits are remunerated at a pre-specified interest rate.

Money multiplier measures an estimate of the maximum amount of commercial bank money that can be created, given a certain amount of central bank money.

Neutrality of money says changes in the money supply might affect output or unemployment levels in the short run only, but neutrality is still assumed in the long run after money circulates throughout the economy.

Portfolio rebalance channel works by reducing the spreads of longer-term yields over expected official rates or short-maturity yields, altering the yield curve; and by reducing the required return on risky assets relative to risk-free assets.

Sovereign risk the risk that a foreign nation will either fail to meet debt repayments or not honor sovereign debt payments.

Systemic risk is the possibility that an event at the company level could trigger severe instability or collapse an entire industry or economy.

The **'too big to fail'** theory asserts that certain corporations, particularly financial institutions, are so large and so interconnected that their failure would be disastrous to the greater economic system and that they, therefore, must be supported by government when they face potential failure.

Velocity of money is the rate at which money is exchanged from one transaction to another and how much a unit of currency is used in a given period of time.

Zero Lower Bound is a macroeconomic problem that occurs when the short-term nominal interest rate is at or near zero, causing a liquidity trap and limiting the capacity that the central bank has to stimulate economic growth.

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List of figures

FIGURE 1 MARKET CAPITALIZATION	10
FIGURE 2 FED BALANCE SHEET AND YIELD OF LONG-TERM SECURITIES	13
FIGURE 3 BANK OF ENGLAND ASSETS AND GOVERNMENT BONDS HOLDINGS	15
FIGURE 4 BANK LENDING TO THE PRIVATE SECTOR IN THE UK, 12-MONTH GROWTH RATES	17
FIGURE 5 THE COST OF CREDIT IN EURO AREA COUNTRIES	19
FIGURE 6 THE GROWTH OF BANK CREDIT TO THE PRIVATE SECTOR	20
FIGURE 7 GENERAL GOVERNMENT DEFICIT	21
FIGURE 8 UNEMPLOYMENT RATE IN EU AND DEBT TO GDP	22
FIGURE 9 HARMONIZED INDICES OF CONSUMER PRICES IN EU	25
FIGURE 10 THE GROWTH OF REAL GDP: UK, USA AND EURO AREA	25
FIGURE 11 BANK NONPERFORMING LOANS TO TOTAL GROSS LOANS (%)	26
FIGURE 12 THE CENTRAL BANK BALANCE SHEET	29
FIGURE 13 THE GOVERNMENT EXPENDITURE INCREASES, SUPPORTED BY MONEY SUPPLY SHIFT	34
FIGURE 14 THE IS-LM MODEL	35
FIGURE 15 OUTPUT GAP IN EURO AREA (% OF POTENTIAL GDP)	37
FIGURE 16 AD-AS MODEL	37
FIGURE 17 THE SOLOW MODEL, FINDING STEADY-STATE	39
FIGURE 18 MULTIFACTOR PRODUCTIVITY (INDEXES) OF CHOSEN EURO AREA COUNTRIES	40
FIGURE 19 THE SOLOW MODEL WITH TECHNOLOGICAL PROGRESS	41

List of tables

TABLE 1. THE BANK OF ENGLAND HOLDINGS OF SECURITIES UNDER QUANTITATIVE EASING	16
TABLE 2. ASSET PURCHASE PROGRAM	23