

Preface

In order to finish our study Applied Economics (master Accountancy – Finance) at Hasselt University we have written this thesis regarding monetary policy, more specifically ‘helicopter money’. We have chosen this subject because of its relevance. More and more authorities in the field of monetary policy are discussing this alternative tool. During the process of writing our thesis we have been able to get new insights concerning the topic and had the unique opportunity to contribute to the debate regarding helicopter money.

We would like to thank everyone who has supported us during this research. First and foremost, we want to thank our supervisor Drs. Willem Vanlaer for the opportunity to write this thesis and the excellent guidance he gave us. Thanks to his help and advise we were able to carry out this research successfully.

We also would like to thank Mr. Boeckx and Ms. Kasongo of the research department of the monetary policy unit at the National Bank of Belgium. During a meeting they have given us new insights in the field of monetary policy and they have provided us feedback concerning our existing research.

Finally, we are grateful for all the support of our family, friends and fellow students during our thesis and our education.

Summary

The main objective of monetary policy is to maintain price stability. The European Central Bank tries to achieve this objective by aiming at an inflation rate below, but close to 2%. In today's situation the inflation rate is too low and this harms the economy in general. It results in more unemployment, more uncertainty, too little investments and too much savings. Therefore, a sound and solid monetary system is necessary to support the economic environment. Central banks have several tools in order to influence this inflation rate. Though, somehow these tools for monetary policy do not seem to be very effective in the Eurozone. That is why we try to figure out whether or not helicopter money could be an interesting alternative for monetary policy. In 1969 Friedman already mentioned helicopter money as a tool to boost the economy and to spur inflation. He introduced the concept of HM as follows: "*Let us suppose now that one day a helicopter flies over this community and drops an additional \$1000 in bills from the sky, ... Let us suppose further that everyone is convinced that this is a unique event which will never be repeated*" (Friedman, 1969, pp. 4–5). Of course, Friedman did not mean to actually drop money out of a helicopter, though his statement is clear. In existing literature HM is more specified as a permanent increase in the money stock in which this newly created money should be free and irredeemable.

In order to give an answer to our research question '*Could helicopter money be a good alternative for the current monetary policy?*' we started this thesis with a theoretical and literature study concerning several components of monetary policy. In chapter 1 we begin to discuss the problem statement and describe the importance of an inflation rate of about 2%. Further, in chapter 2 the current tools for monetary policy are being analyzed. Here we examine extensively the four tools being used by the ECB, namely adjusting short-term interest rates, negative deposit rates, quantitative easing and targeted longer-term refinancing operations. In chapter 3 we describe the mandates of the ECB and the Federal Reserve only briefly because this thesis focuses on the economic aspects of monetary policy and not the legal domain of it.

In chapter 4 we discuss in detail the different ways to implement HM and how the central bank could increase the money stock. Because little research has been done in the past this chapter is based on existing literature as on our own critical opinion. We discuss three different types of implementation, namely 'HM for households', 'HM through government institutions' and 'HM through the European Investment Bank (EIB)'. The first category, 'HM for households', consists of three possible methods: a check in the mail, a deposit into people's bank account and vouchers. Secondly, 'HM through government institutions' has also three different ways of implementation. It can be done by an increase in public spending, a tax-rebate or the government could make use of the three methods concerning 'HM for households'. The third category 'HM through the European Investment Bank' implies that the ECB hands over funds to the EIB. The EIB could then provide funding for investment opportunities within the Eurozone. For each individual manner of implementation we examine some advantages and disadvantages. At the end of this chapter all pros and cons are being compared in order to come to a conclusion about which form of HM is theoretically the most plausible. Concerning this, we have reached a conclusion that, in our opinion, the most interesting way to implement HM would be through government institutions. This way the central bank can decide whether or not to deposit money into the bank account of the governments. This money could

then be used in order to increase public spending, to make use of a tax-rebate or to distribute it towards citizens by issuing checks, vouchers or by depositing the means into people's bank accounts. This process should in turn result in economic growth and an increasing inflation rate.

Concerning chapter 5 of the thesis, our main purpose is to examine whether or not helicopter money is actually 'free money' as mentioned in existing literature. In order to give an answer to this question a detailed study of the money flow has been conducted. By doing this we made our contribution to the existing literature concerning HM. That is, up till now we have not found academic research concerning the total money flow of helicopter money. After a profound analysis of this circulation we come to the conclusion that helicopter money is not as free as intended. We can conclude that HM, as discussed in existing literature, actually does bear some form of implicit cost. Depending on the situation this cost would be borne by either the commercial banks, the public or the central bank itself. During the second part of chapter 5 we try to put forward some measures in order to predict the amount of HM that should be created when making use of 'HM through government institutions'. Measures such as the output gap, fiscal multipliers and Gross Domestic Product (GDP) are being used. Though as we also mention during the discussion, we should be careful when using these measures in order to predict the amount of money creation. This because a lot of assumptions and estimates have to be made in order to make some predictions.

At last we come to an overall conclusion where we want to answer our research question: *'Could helicopter money be a good alternative for the current monetary policy?'*. After writing this thesis we can formulate with caution that theoretically HM could be an alternative tool. Although, we also mention that there still does exist a lot of uncertainty concerning this topic. For example, in practice no certainty can be given about the reaction of the public regarding an implementation of HM. In theory it could be perfectly possible to use 'HM through government institutions' successfully. Also the other types of implementation, 'HM for households' or 'HM through the EIB', could be possible alternatives, nevertheless we do mention that 'HM through government institutions' has our preference.

Contents

Preface	I
Summary	III
List of figures	VII
Chapter 1: Introduction	1
Chapter 2: Current monetary policy	5
2.1 <i>Adjusting short-term interest rate (discount rate)</i>	5
2.2 <i>Negative deposit rates</i>	6
2.3 <i>Quantitative easing (QE)</i>	7
2.4 <i>Targeted longer-term refinancing operations (TLTRO's)</i>	8
2.5 <i>Results in inflation and private credit growth</i>	9
Chapter 3: Mandates of central banks	13
Chapter 4: Implementation of helicopter money	15
4.1 <i>HM for households</i>	16
4.1.1 <i>A check in the mail</i>	21
4.1.2 <i>A deposit into a bank account</i>	21
4.1.3 <i>Vouchers</i>	22
4.2 <i>HM through government institutions</i>	22
4.2.1 <i>HM – increase in public spending</i>	23
4.2.2 <i>HM – tax-rebates</i>	25
4.3 <i>HM through the European Investment Bank</i>	31
4.4 <i>Overall difficulties concerning the implementation of HM</i>	33
4.5 <i>Money creation</i>	35
4.5.1 <i>HM through government institutions</i>	35
4.5.2 <i>HM for households</i>	39
4.5.3 <i>HM through the European Investment Bank</i>	39
4.6 <i>Chapter summary</i>	40
Chapter 5: Statistical research	43
5.1 <i>Balance sheets and money flow</i>	43
5.1.1 <i>Money flow of ‘HM for households’</i>	43
5.1.2 <i>Money flow of ‘HM through government institutions’</i>	47
5.1.3 <i>Money flow of ‘HM through the European Investment Bank’</i>	49
5.1.4 <i>Is helicopter money ‘free money’?</i>	51
5.2 <i>Important factors concerning the magnitude of HM</i>	55
5.2.1 <i>Fiscal multipliers</i>	55
5.2.2 <i>Output gap</i>	56
5.2.3 <i>Example</i>	56
Conclusion	59
Reference list	61
Appendix 1.1 - Pros and cons of all methods of implementation	67
Appendix 1.2 - Pros and cons of all methods of implementation	68
Appendix 2 - Fiscal multipliers	69
Appendix 3 - Output gap	70

List of figures

Figure 2.1 - Interest rates	6
Figure 2.2 – Running out of German Bonds to buy	8
Figure 2.3 – Inflation rate (Eurozone)	10
Figure 2.4 – Private credit growth	10
Figure 4.1 – Poverty rate (2013)	19
Figure 4.2 – Household savings (% of households disposable income)	20
Figure 4.3 – Average hours lost in traffic jams (2014)	24
Figure 4.4 – Belgian life expectancy & retirement age	30
Figure 4.5 – Net pension replacement rates	30
Figure 4.6 - Public sector balance sheets after money finance	36
Figure 4.7 - Public sector balance sheets after money finance	37
Figure 4.8 - Consolidated balance sheets of government and central bank	38
Figure 4.9 - Transfer of money from central bank to households	39
Figure 4.10 - Transfer of money from central bank to EIB	40
Figure 5.1 – Money flow 'HM for households'	46
Figure 5.2 – Money flow 'HM through government institutions'	48
Figure 5.3 – Money flow 'HM through the European Investment Bank'	50
Figure 5.4 – Money flow 'HM for households'	54

Chapter 1: Introduction

At this moment the inflation rate is too low and the economy does not seem to get back on track. Inflation is a very important aspect of the economy. It can be defined as an increase in the general price level of goods and services in an economy over a certain period of time (*Van Overtveldt, J., Vanlaer, W. 2016*). This implies a reduction in the purchasing power, people can buy less with the same amount of money. But it also reduces unemployment due to 'nominal wage rigidity', also called 'sticky wage theory' (*Fehr, E., Goette, L. 2005*). This theory means that it is easier for employers to implement salary increases which are lower than the inflation or keeping wages constant. In case of deflation or when there is no inflation, this would be impossible and employers will be forced to lay off employees or to cut wages.

Also, low inflation is a result of unused capacity. Due to the fact that our economy is facing unused labor and resources the inflation rate is low. In order to boost the economy and this inflation rate a stimulation is needed (*Ross, S. 2014*).

According to John Maynard Keynes, inflation is necessary to prevent 'the paradox of thrift', also called 'the paradox of savings'. This paradox implies that in times of a recession or a period with high uncertainty consumers will spend less money and save more. They save enough money to get through difficult moments in the future. Because of these savings demand will decrease and this will lead to less production with all its consequences. That is why Keynes argued that some inflation would benefit our economy and prosperity (*Krugman, P. 2009*).

A final important advantage of inflation is linked to debt. Inflation has the effect of eroding debt, it reduces the value of debt. It is interesting to borrow money now and repay this loan in the future with money that is less valuable than the amount they borrowed. Especially governments are in favor of inflation because they have a large amount of debt (*Fischer, I. 1933*). Though, besides all these advantages, too much inflation is not good either. Too much inflation reduces the value of money unless interest rates are higher than inflation.

At this moment the inflation rate is too low in the most important economies around the world. The Eurozone's inflation rate is approximately 0,4%, in the United States this percentage is a little higher (just above 1,0%) and Japan (-0,5%) is facing deflation (*OECD, 2016*). In this thesis we will mainly focus on the situation in the Eurozone in order to give a clear overview of the situation and to keep it simple to understand. However, sometimes we will refer to other central banks to identify differences and similarities between monetary authorities and because of the fact that most of the existing literature focuses on the situation in the United States.

The fact that the inflation rate is too low results in lower prices, more unemployment, more uncertainty, underinvestment and too much savings. Under the current circumstances families and businesses invest too little and save too much because of uncertainty in order to get the inflation rate back to the normal level. An explanation refers to the 'global savings glut', this term indicates a situation in which the world's desired saving exceeds desired investment. The result of this is that it depresses the

natural real rate of interest, a mechanism which brings savers' and investors' different desires in balance (*Bernanke, B. S. 2005*). There are several potential reasons for the ex-ante excess supply of savings over investments. For example, the fact that people tend to live longer but do not necessarily work longer. This phenomenon creates the need to save more in order to bridge the financial gap when one retires. A second cause concerning the global savings glut could be the fact that people are still paying off debt as a result of the recent financial crisis. Also, rising inequality could contribute to this savings glut. Because rich people tend to save more of their extra income a rising inequality could result in more savings (*Fels, J. 2015*). Other parties who are involved are governments. Because of their savings policies they put more pressure on the economy and the inflation rate remains low. That is, when the authorities for example increase (in)direct taxes in order to balance their accounts less income will be available for the public to consume.

This is why policymakers need to use measures to raise the inflation rate. The European Central bank (ECB) tries to achieve an inflation rate of about two percent. Today, there are several monetary tools being used to accomplish this goal. The first mechanism to manipulate the inflation rate is adjusting a short-term interest rate called 'the discount rate' (*The Federal Reserve Bank of San Francisco, 2004*). Banks can borrow reserves directly from central banks and they will be charged a discount rate. This rate will be determined by central banks. 'Quantitative easing' (QE) is the second tool to modify the inflation rate. The intent of this mechanism is affecting short-term interest rates through open market operations (*Joyce, M., et al. 2012*). Central banks purchase government securities and other securities from markets with the intention of lowering interest rates and increasing the money supply. A third instrument central banks can use to solve the problem of inflation is a negative interest rate policy (NIRP) (*Rosenberg, D. 2016*). Central banks implement negative interest rates, meaning that commercial banks have to pay a 'fee' to hold reserves with the central banks. By doing this, they want to encourage the financial institutions to lend their money to households and firms instead of holding it as a reserve. The final tool used by central banks is 'targeted longer-term refinancing operations' (TLTRO's). These operations imply that central banks provide financing to financial institutions for periods of up to four years. Central banks offer attractive conditions in order to stimulate the real economy by lending these means to households and corporations (*European Central Bank, 2016*).

It is obvious that a sustainable inflation rate is necessary for a healthy world economy. As existing literature has already demonstrated, the monetary measures do not seem to be fully effective in the circumstances of today. These instruments are not sufficient to solve the problem of a too low inflation rate. Particularly in the Eurozone (and in Japan) the intent to achieve an inflation rate of about two percent cannot be realized. Leaders of central banks have already indicated that their capabilities are not limitless. The conventional monetary policy of these central banks is almost exhausted (*Van Overtveldt, J., Vanlaer, W. 2016*).

With this in mind we can say that there is need for an alternative solution. Helicopter money (HM) could be an alternative. However, there are still many aspects that need further research before it can be used. In this thesis we take a first step in that direction.

The term 'helicopter money' refers to an idea of Nobel laureate Milton Friedman in 1969. He introduced HM in his famous paper "The optimum Quantity of Money". To illustrate this Friedman used simplicity so it would be clear to everyone.

"Let us suppose now that one day a helicopter flies over this community and drops an additional \$1000 in bills from the sky, ... Let us suppose further that everyone is convinced that this is a unique event which will never be repeated". (Friedman, 1969, pp. 4-5)

He does not mean throwing money out of a helicopter literally, but the notion behind this is that money needs to go to the public in a direct way. As mentioned in existing literature, the idea behind HM today is different from what Friedman had in mind. Usually HM is described as follows: a money-financed fiscal expansion by central bank money and this instrument has only to do with asset purchase programs in an indirect way (Cecchetti, S. G., Schoenholtz, K. L. 2016). However, HM does not need to be carried out in this way, per definition. There are other options to implement HM, this we will examine during this thesis. Sometimes in literature they refer to HM as 'QE for the people' (Cassidy, J. 2016).

Over the years we have seen an increasing economic integration. This brings many opportunities with it, such as entry and expansion into new markets around the world. A good economic system is essential to support this globalization. Because of this fact, it is important to achieve a healthy inflation rate of about two percent. Due to this globalization the policy determined by monetary policymakers of the ECB can affect markets outside the Eurozone.

With all this in mind it becomes clear that a sound and solid monetary system is of great importance in order to support the overall economy and to boost inflation. Therefore, this topic is quite relevant.

Chapter 2: Current monetary policy

The last couple of years, the European Central Bank has been trying to get the inflation back on track. Like already mentioned, the central bank is using four main tools of monetary policy to achieve the goal of price stability:

- adjusting short-term interest rate (discount rate);
- negative deposit rates;
- quantitative easing (QE);
- targeted longer-term refinancing operations (TLTRO's).

Where this thesis does not have the intention of making a profound analysis of monetary policy applied today it is nevertheless important to get an overall view of the current tools being used. That is why this chapter will briefly discuss the tools listed above.

2.1 Adjusting short-term interest rate (discount rate)

The first tool applied by the ECB is the discount rate. Like already mentioned in chapter 1, the discount rate implies the cost a financial institution bears to get a short-term loan from the central bank. By looking at figure 2.1, a clear downward trend can be observed (yellow line). At this moment the discount rate is notated at zero percent. This basically means that banks can get free loans from the ECB. Because of this, financial institutions are less interested in lending money from the public, which results in low interest rates received by those who deposit their money on a savings account. By lowering the interest received on deposits it should become more interesting for the public to spend their money and therefore increase consumption and inflation. Also because of the fact that the ECB offers cheap money, low-interest-rate-loans can be offered by the commercial banks. This way people and businesses should be encouraged to consume or invest in the real economy.

This is the main tool central banks use to influence their inflation goal. Because this discount rate is already at the zero lower bound (ZLB), central banks cannot use this tool anymore to increase the inflation rate.

Figure 2.1 - Interest rates

Source: Thomson Reuters Datastream

2.2 Negative deposit rates

Another mechanism used by the central bank is the negative deposit rate financial institutions face these days. This relatively new tool has the intention of encouraging banks to lend or invest the money they receive. When banks do not invest this money and thus deposit it overnight at the central bank they are charged a fee of 0,4%. The evolution of this deposit rate can be seen in figure 2.1 (red line).

Concerning this tool for monetary policy, there do exist some risks that should be further discussed. For example, when financial institutions are being 'fined' 0,4% for depositing money at the central bank it could be possible that these financial institutions will invest money in projects they normally would not accept, just to avoid the negative deposit rate in the urge for profit. By doing this the risk profile of the bank could be out of balance, which could increase the probability of default (*Randow, J., Kennedy, S. 2016*). Another risk exists when financial institutions would decide to pass on this cost to their customers. That is when the public has to pay interests when depositing money. It could become more interesting to just withdraw their funds and keep it in cash. This because the explicit cost of holding cash is zero and thus less than depositing it with the bank. The danger in this exist that more and more people would begin withdrawing their money with the result of a bank run (*Kane, C. 2016*). This is something that has to be avoided at all times. Also, commercial banks may be reluctant to pass on these negative rates to their depositors because they do not want to lose their customers. For example building societies, a type of mutually owned bank, rely on their deposits. However these same banks earn returns on assets that are interest rate sensitive, like mortgages. Due to a negative deposit rate the profitability of financial institutions will decrease (*C. W. 2015*).

One could ask if this is desirable in a time banks are still recovering from the recent financial crisis. The aim of monetary interference is to power the rapid recovery of the economy, however, damaged financial institutions will not foster this recovery. Though, it is also important to mention the implicit cost of holding cash, which will not be zero. Examples of costs concerning cash could be: purchasing a safe and the risk of money getting stolen. These costs could make it less interesting for the public to actually withdraw all their funds deposited.

It can be concluded that this negative deposit rate will bring extra costs to the financial institutions. By 'fining' them when holding extra reserves their profitability will decline. This extra cost related to the negative deposit rate will be discussed later on in chapter 5.

2.3 Quantitative easing (QE)

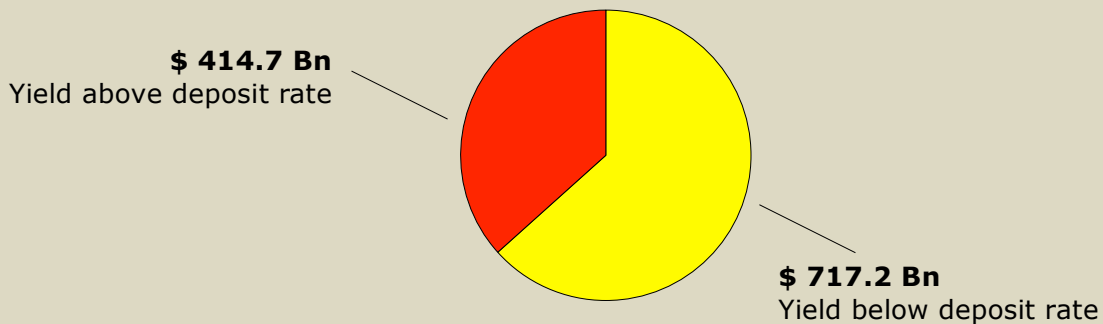
'Quantitative easing' is another tool to modify the inflation rate. The intent of this mechanism is affecting short-term interest rates through open market operations. Central banks purchase government securities and other securities from markets with the intention of lowering interest rates and increasing the money supply. As will be discussed later in this chapter, banks often have the urge to invest in sovereign debt instead of lending money to the public (*Joyce, M., et al. 2012*). The Basel Agreements make use of some capital requirements based on risk weighted assets, this implies that these requirements mark sovereign debt as risk free (*Bank for International Settlements, 2011*). This could give banks incentives to load up on sovereign debt. Because of the fact that sovereign debt bears no or low risk, it could be more interesting to invest in these bonds rather than risking money over loans to the public. When the central bank uses QE they buy bonds on a big scale. By doing this the interest rate of these securities will drop which will make it less interesting for banks to further invest in sovereign debt because the return on this asset will decline. This should lead the financial institutions to lend more money to the public instead of increasing its balance sheet with government bonds (*Hirsch, P. 2008*).

Recently, the ECB decided to expand its QE-program. At this moment the ECB conducts a monthly asset purchase of € 80 billion instead of the previous € 60 billion. One could ask if there is still potential to further increase this QE-program (*European Central Bank, 2016*). A reason for this concern can be explained as follows. To determine how much government bonds have to be bought of each country the capital key¹ is being used. Germany, which has a large economy and a big population, would be supposed to make up 25 percent of total purchases (*Moore, E. 2016*). Besides that, the ECB may only buy bonds with a yield higher than the deposit rate that is currently notated at -0,4 percent (*Ducrozet, F. 2016*). Knowing this, Figure 2.2 indicates the decreasing number of available German bonds. If the ECB should decide to further expand the QE-program a reorganization of this system has to be executed (*Moore, E. 2016*).

¹ This key determines how much capital each country has to contribute to the ECB depending on population and gross domestic product (*European Central Bank, 2015*).

Figure 2.2 – Running out of German Bonds to buy

More than 60 percent of nation's bonds yield less than the ECB deposit rate of minus 0,4%.



Source: Bloomberg Germany Sovereign Bond Index

Also, this tool of monetary policy does not come without risks. When QE does not work as intended a devaluation of the currency could occur. Obviously, a small devaluation in the currency would be no big deal. This actually is one of the purposes. When the euro devaluates it becomes easier to export products, which has a positive impact on the economy. Though, when the devaluation becomes too big it will be harmful. Another problem that may occur is the creation of asset bubbles. This because the risk exists that the injected money will flow into bonds and other assets instead of benefiting households and companies (*Randow, J. 2016*). For example, Kate Allen (*2015*) warns for the risk of fueling house price bubbles. Since 2010 house prices have surged in Germany (25%), Norway (30%) and in the UK (15%). This could be explained by the low interest rates and the weak returns on other assets. The risk of overvaluation in this sector is real. It makes sense that the creation of bubbles can become dangerous. When the bubble is getting too big a burst could appear with a fast drop in prices as a result. This is something that has to be avoided. Also the risk of rising inequality could emerge from a tool as QE. In a keynote speech Yves Mersch states that this type of monetary policy could create an upward moving inequality. One reason for this could be explained by what he calls, 'the income composition channel'. What this means is that while most households rely on earnings from their job, the more wealthy households' income can depend in greater extend from businesses and financial income. In the case that quantitative easing would raise profits (from business and financial income) more than wages a greater inequality may emerge (*Mersch, Y. 2014*).

2.4 Targeted longer-term refinancing operations (TLTRO's)

The final tool being used by the ECB is the principle of TLTRO's. Targeted longer-term refinancing operations are designed to make it more attractive for financial institutions to grant loans to the public. Commercial banks are able to get long-term funding (up to 4 years) at favorable interest rates when the money is directly invested in the real economy. The amount of money that can be borrowed is linked to their loans towards non-financial corporations and households. The interest rate that has to be paid is notated at zero percent. This percentage can drop further to a minimum of -0,4%. This reduction will also depend on the bank's lending pattern (*European Central Bank*). This

mechanism consists of two series of financing, namely TLTRO I and TLTRO II. The first operations of this measure (TLTRO I) started in September 2014. A second program (TLTRO II) will be conducted in four quarterly operations. The first two undertakings are already implemented in June and September 2016, the other two will be carried out in December 2016 and March 2017. Mario Draghi, president of the ECB, said that this tool was successful. Although TLTRO's had a positive effect, this program was not able to get the economy back on track (*Merler, S. 2016*).

One main advantage is the fact that the loans under TLTRO have a longer maturity in comparison with ordinary loans. This will ensure stable and dependable financing for commercial banks in times of market uncertainty. A second benefit of this mechanism is that the amount one can borrow at the central bank depends on the number of loans they provide to the real economy. Also the cost of borrowing depends on this condition (*European Central Bank, 2016*). This seems like a good measure in order to achieve an inflation rate of about two percent. However, it could be that there is a lack of demand by the private sector for credits, even if the conditions for these loans are very favorable. If there is no demand for these credits it makes no difference whether commercial banks can borrow against interesting conditions or not. In this situation the money will remain at the financial institutions and thus there will be no support for economic growth.

2.5 Results in inflation and private credit growth

All monetary tools discussed above were implemented with the intention of reaching price stability, more specifically an inflation rate of about two percent. So far, all the measures taken by the European Central Bank do not seem to be very effective. Figure 2.3 gives an indication of the inflation rate in the Eurozone from the year 2000 until July 2016. It is clear that the aimed price stability of two percent is far from reached even though we have witnessed a great expansion in monetary policy in the past few years. One could ask if further expansion of the current monetary policy being applied would be very useful. Maybe it is time to rethink the approach of achieving price stability. That is why this thesis will discuss an alternative tool for monetary policy, namely helicopter money.

Figure 2.3 – Inflation rate (Eurozone)

Source: European Central Bank (Statistical Data Warehouse)

Figure 2.4 indicates the growth in consumption credit (blue line) and mortgage loans (green line) in the Eurozone. An upward movement for both types is present after the year 2014.

Figure 2.4 – Private credit growth

Source: Thomson Reuters Datastream

Because commercial banks have access to free money consumers are able to get low-interest-rate-loans, which makes it more interesting for them to invest in their projects. Also the TLTRO's could play an important role as this tool makes it possible for the financial institutions to get long term funding (four years) supplied by the central bank,

when money is directly invested in the economy (*European Central Bank, 2016*). Even though there is a clear upward movement in credit growth, one could discuss that there should be more upward potential taken into account the extreme low borrowing rates. A possible explanation for this phenomenon will be discussed very briefly.

Due to the financial crisis we witnessed, more and more regulation has emerged concerning the capital financial institutions must hold to overcome potentially new bankruptcies. These rules are also known as the Basel Agreements. To calculate the necessary amount of capital regulators take into account the 'risk weighted assets' instead of total assets possessed by a financial institution (*Bank for International Settlements, 2011*). This means that only the assets that contain a certain amount of risk will be taken into account. When financial institutions succeed in holding their capital low, a same profit will result in a higher ROE². It thus makes perfect sense that these financial institutions want to manipulate somehow their risk weighted assets. This would mean that it often would be more interesting for these banks to invest in, for example, government bonds which have low to zero risk according to the Basel Agreements instead of selling loans to consumers and businesses which have higher risks (*Duchateau, S. 2016*).

By knowing the above it is clear that financial institutions are not willing to increase their lending to businesses and consumers by too much. This because their risk weighted assets would rise when they would increase their lending to consumers and businesses. This rise in risk weighted assets would result in higher capital needs and a lower ROE (*Duchateau, S. 2016*).

If this reasoning actually holds, it is not hard to conclude that the regulation imposed limits the potential credit growth resulting in lower economic improvement. This could also mean that further expansion of the monetary tools as explained above would not necessarily mean a further upward moving credit potential. The problem could just be the fact that regulation acts as a barrier for further growth. This limitation is something that can be avoided when using HM. Depending on how HM will be implemented the money supplied could go straight to the public rather than to the financial institutions.

Because making an improvement in regulation is no subject of this thesis, there will be no further discussion concerning this theme. Though, it is worth mentioning that the cause of low inflation could also be triggered by the Basel Agreements and the structure of the financial system as a whole. Further improvements in this area could also contribute to more financial stability and a more solid economy can arise.

² ROE: Return on equity. A ratio to express the profit of the equity invested.

Chapter 3: Mandates of central banks

The mandates of central banks are an important aspect concerning the implementation of HM. These statutes determine which the empowerments of central banks are. Differences in authorizations between central banks are likely due to the fact that there are differences in economic structures and cultures all over the world. Although this facet is important for the development of HM, it is not the intention of this thesis to examine the mandates deeply. The reason for this is that changing statutes concerns juridical expertise, this thesis however focuses on the economic part of HM. Therefore, this chapter will give a short overview of the current mandates in order to know what central banks are allowed to do and what their main tasks are. In the previous chapter the current tools of monetary policy are already mentioned. Regarding to these tools and other alternative policies, there are some important principles we need to keep in mind.

We will briefly examine the statutes of central banks of some of the world's largest economies, namely the ECB and the Fed. First we will discuss the mandates of the ECB. Since 1999 the ECB is responsible for monetary policy in the Euro area, one of the largest economic areas in the world. Their institutional framework of monetary policy is based on two fundamental principles which are essential for a sound monetary policy. First, the main objective of the ECB is to maintain price stability. The second principle states that the central bank should be independent. These two principles are important in the discussion of HM. Sometimes in literature it is mentioned that independent central banks were favorable in times of high inflation. However, some argue that in situations as today (disinflation and large output gaps) collaboration between monetary and fiscal authorities is needed (*Fels, J 2016*). According to the statutes of the ECB monetary financing of public authorities (fiscal policy) is forbidden for central banks (*Treaty on European Union and Treaty on the Functioning of the European Union - Consolidated versions of the Treaty on European Union and the Treaty on the Functioning of the European Union, 2012*). This can cause a problem for the various ways HM can be implemented. An amendment would be necessary if one wants to change it, although it should not be a problem for all possible methods of HM. Secondly, the United States of America who has the largest economy and the Federal Reserve as their main body in the field of monetary policy. Their statutory objectives for monetary policy are the following: maximum employment, stable prices and moderate long-term interest rates. As the Federal Reserve Act states:

"The Board of Governors of the Federal Reserve System and the Federal Open Market Committee shall maintain long run growth of the monetary and credit aggregates commensurate with the economy's long run potential to increase production, so as to promote effectively the goals of maximum employment, stable prices, and moderate long-term interest rates" (Federal Reserve Act, 2013).

The Fed has no legal authority to distribute newly created money to consumers without getting something in return which is equal in value. To distribute this money to consumers assets swaps³ are needed. They are legally bound in its ability to swap assets

³ "Asset swaps combine an interest-rate swap with a bond and are seen as both cash market instruments and also as credit derivatives. They are used to alter the cash flow profile of a bond. An asset swap package involves transactions in which the investor acquires a bond position and then enters into an interest rate swap with the bank that sold him the bond. The investor pays fixed and receives floating. This transforms the fixed coupon of the bond into a Libor based floating coupon" (*Pereira, R. 2003*).

with the private sector, these are generally limited to government-guaranteed assets (*Hüttl, P. & Leandro, A. 2016*).

A comparison of the mandates of these two central banks shows that there are similarities such as the principle of price stability, but there also exist some differences. This indicates that it is not easy to apply just one form of HM for all central banks. Each central bank has its own characteristics and mandates, which can be a determining factor in the choice of the form of HM which would suit best.

Chapter 4: Implementation of helicopter money

Helicopter money is not another version of unconventional monetary policy. HM is an expansionary fiscal policy, an increase in public spending or a tax cut, financed by a permanent increase in the money stock (*Bernanke, B. S. 2016*). Or as Bernanke calls it, a *Money-Financed Fiscal Program (MFFP)*. This can be used to encourage economic growth and thus to achieve the inflation goal. The term 'permanent' is a crucial feature. In existing literature there are often discussions about how central banks can promise credibly that this increase in the money stock will be permanent. This refers to 'time-inconsistency', also called 'dynamic-inconsistency', which means that the incentives of policymakers to keep their commitment are significantly less than their incentives to make their commitment (*King, A. 2009*). For example, the money stock should not be lowered if the inflation rate would rise sharply. This credible sign of permanent increase in the money stock, which central banks have to assure, is very important for the implementation of helicopter money. Although this is an important feature, only economists ask if this increase is permanent, the rest of the world asks "what shall I do with this money?" (*Lonergan, E. 2016*). Also, the Ricardian Equivalence principle is an important and relevant aspect of HM. It is an economic theory that assumes that consumers will save their money (and thus will not spend the money) as a response to a tax cut by the government or an increase in debt-financed government spending to stimulate the economy. This theory suggests that demand remains unchanged due to the fact that people save their excess money to anticipate future tax increases, which will be used to pay off the debt that is created by the government. When using HM there is not necessarily a creation of new debt. If central banks distribute newly created funds directly to consumers there is no creation of debt. When no new debt will be created, the public should not fear future tax increases. This would mean that the Ricardian Equivalence principle should not hold under this tool for monetary policy. However, if we think about HM as a MFFP there will be an increase in governments' deficits and thus there is a debt creation. Nevertheless, this debt creation does not imply a reimbursement of the principle nor an increasing interest burden. In order to overcome the Ricardian Equivalence principle a good informed public is therefore very important.

Knowing all this, several possible ways to implement HM can be thought of. These various methods can be divided into three categories, namely 'HM for households', 'HM through government institutions' and 'HM through the European Investment Bank'. This chapter will give an extensive view of all these methods and will expose the advantages and disadvantages of each method. Also the transfer of the 'free money' is an important aspect and will be discussed. Besides that, this section will question critically all different approaches. Finally, the various methods of HM will be evaluated and compared with respect to each other. By doing all this it is possible to make a valid judgment about the approaches and to discuss the consequences of a potential implementation. As already mentioned, not that much (academic) literature is available on this topic. Therefore, we will also use our own interpretation and criticism which will be sourced as much as possible.

4.1 HM for households

The first possible method of HM consists of transferring newly created money directly to households. This transfer of money could be done by granting a perpetual loan to households at a zero interest rate (*Loneragan, E. 2016*). We will focus on this way of transferring because it is the most obvious one. By granting these zero-interest-rate-loans to the public, consumers can use this 'free money' to invest and to buy goods. This would encourage economic growth and will increase the inflation rate. The implementation can be done in three different ways: a check in the mail, a deposit into a bank account or by using vouchers.

The first category of HM ('HM for households') has some general advantages and disadvantages which apply to all three different methods within this category. Besides these main pros and cons, every method within this category has its own benefits and drawbacks.

This alternative way of monetary policy has one big advantage relative to some current monetary tools: the means will go directly to consumers because no intervention by financial institutions to distribute the money is needed. This measure would overcome the problem that these institutions are reluctant to grant loans to business and households. Another benefit could be that people are more likely to experience this tool as 'free money' than if the government would make use of a tax-rebate. Consumers receive money directly in their pockets which can be spend as pleased. If a government would use the same amount of money to give people a tax-rebate, it would be distributed in an indirect way. This makes it less obvious to people that they are distributed 'free money'. Another explanation for this benefit is the Ricardian Equivalence principle which could occur in case of a tax-rebate. This is a psychological element that should not be underestimated. One more advantage of directly handing over these newly created funds to the public could be a better distribution among sectors. When money is directly given to the public, they can spend or invest it as pleased. For example, a person could prefer to buy some extra clothes, a new phone or to spend the funds on a dinner in a restaurant. In the situation as it is today, funds created by the central bank are more likely to flow into more capital-intensive sectors like housing, the automotive industry and other assets that can be bought under a consumption credit. When the 'free money' HM entails flows to consumers it will get spread throughout the whole economy. People will spend the 'free money' on goods and services from all sectors. In this way the economy can get a boost, even in times of low consumers confidence. Perhaps people do not want to invest in expensive goods because of their low confidence in the economic environment at that moment but they can use these means to purchase essential goods. When policymakers would choose for an increase in public spending through government interventions only a few industries will benefit.

A major disadvantage of this category of HM could be that many individuals have incentives to save the amount of money they received. Due to the recent financial crisis it could be that the public still has a negative view concerning the future. It could therefore be possible that these people would decide to save their money today in order to bridge declining future income. A counter-argument to this drawback is that central banks can raise the amount of HM until debts are paid off and consumers are again willing to consume. But because there is no certainty people will spend enough of this money, it is a difficult exercise to determine the right amount each individual should get.

In this regard, 'HM through government institutions' or 'HM by the EIB' could be a better solution. However, it is possible to prevent people from saving the amount received. The central bank can take all kinds of measures to ensure that people can not save these means. This will be explained later this chapter. Another disadvantage could be that this implementation is too complex to carry out. For example, if the central bank needs to create a new bank account for each citizen, it might be hard to execute this if the IT-system of the central bank is not sufficient enough in order to fulfill this implementation. A final argument against 'HM for households' we quote is that the central banks may lose their independency when they would start distributing money directly to consumers. That is, using HM this way the central bank has to decide on how to allocate the newly created funds. However, these decisions are more related to fiscal policy and should therefore be a governmental concern. Also, central banks are not allowed to interfere with fiscal policy. By making use of governments as an intermediary the loss of central bank's independency will be smaller.

Besides the above, there are some other important details involved. A first factor is to determine which people would get money from the central bank. Should each citizen of a community get 'free money', only the workforce or everyone above a certain age (for example everyone older than 18)? Will companies also receive money or not? What about small business-owners, will they receive money as an individual and as a 'company'? Maybe this could be a good idea, however, there are already many firms that have a surplus of funds. Considering this, HM should perhaps only be applied to the public. To clarify this thorny issue an example is used.

Example 4.1

Imagine that there are two people in a community, person A is a small business-owner and person B is not a business-owner. What if the central bank decides to distribute € 100 to each citizen and business? Person B receives € 100 in total, while person A receives the same amount as well as his company. The firm can then pay this amount to the owner (person A) via a dividend or a salary. Assuming that the tax which must be paid on it is 30%, person A receives € 70 net from this action and he will have € 170 in total which he can spend or save. Compared to person B, he has an advantage by owning a business.

If only citizens would receive an amount of 'free money' these funds will go to companies through the spending of consumers. In turn these firms can use these means to invest or to save. We can therefore conclude that there is no need for 'free money' that goes directly to businesses.

Another aspect is the amount of money that should be used to distribute. Central banks must estimate how much extra money is needed so that the inflation rate would rise sufficiently. An important condition is that people should consider this amount of money as an additional income. It is obvious that € 10 per person each month would be insufficient for most people because this amount is nothing compared to their monthly salary. If they would receive € 200 each month the measure would be more valuable. A possible solution to this problem is that people receive € x (this can be € 100 or even € 300) each month until the inflation target is reached. After this goal is achieved the central bank can remove this stimulus at once or gradually. The implementation of this category of HM does not need to be limited in time, it is possible to apply this measure

repeatedly until the inflation target is back at the desired level. When policymakers opt for an intermediation of governments it could not be favorable to apply this measure repeatedly. The reason for this will be studied later on.

All three possibilities of 'HM for households' can be used once or repeatedly in time. Policymakers can opt to apply a particular method every month (for example, a whole year long) or they can choose to apply this method only once. Example 4.2 gives a short explanation.

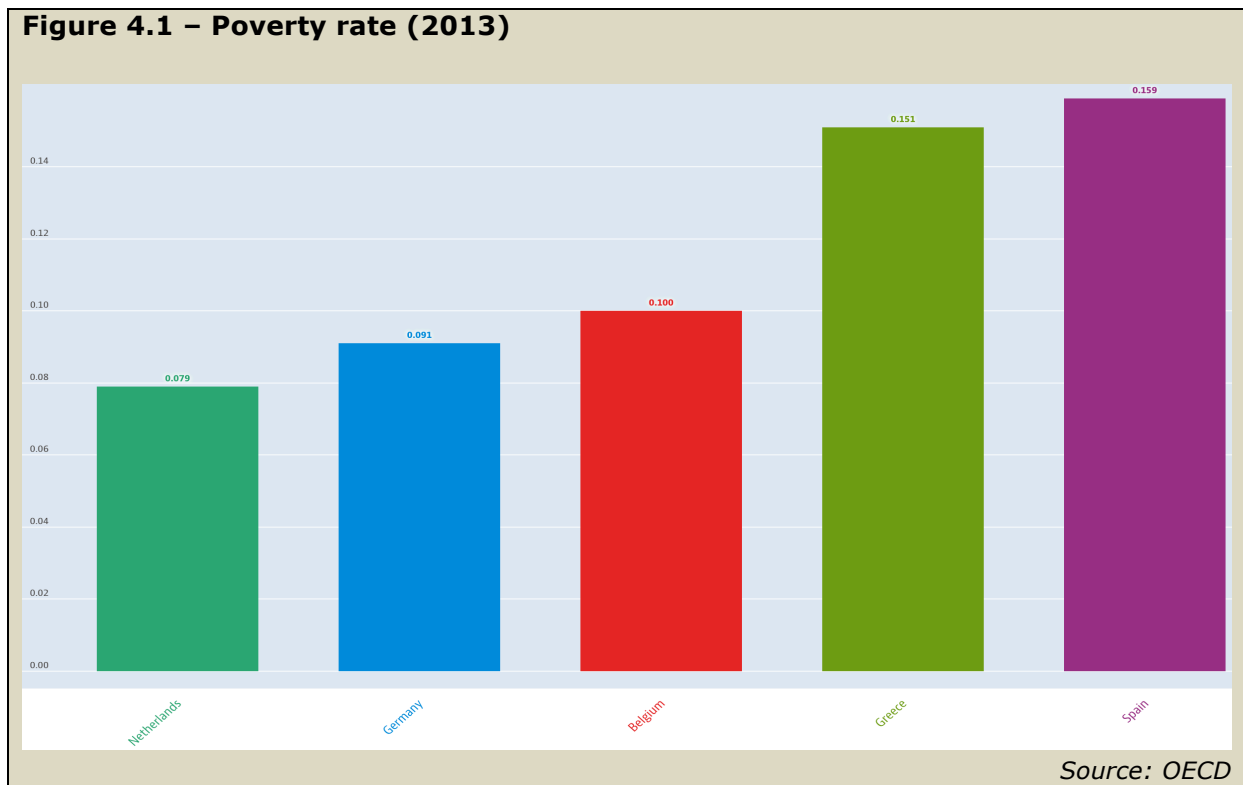
Example 4.2

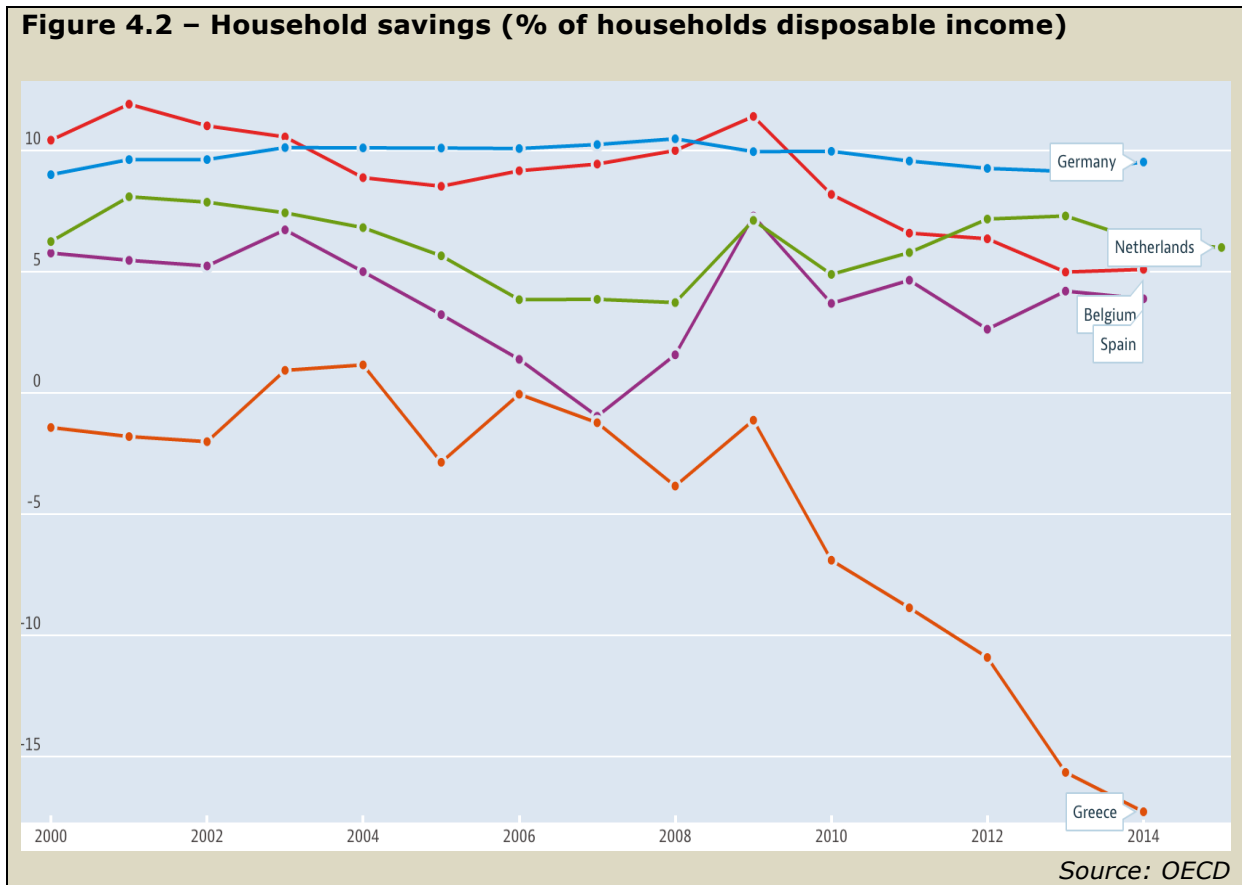
Monetary authorities can give every month € 200 (for one year) to each person of a community, which results in € 2.400 per person in total. This same amount can also be paid at the beginning of the period, each person immediately receives € 2.400. Although this seems to be the same amount of money at first sight, there is an important difference between these two alternatives.

This example illustrates that the people in the first scenario can use the money to buy goods on a monthly base. This can result in multiple purchases of goods with lower prices (if people do not save the money to spend it later all at once). In the second scenario, people receive the money all at once and are thus able to buy more expensive goods. Depending on the purpose that central banks have in mind to stimulate the purchase of essential goods or luxury goods, this detail should be taken into account. It may be beneficial for people who are living on the poverty line to receive a weekly or monthly amount of money. They face difficulties to make both ends meet, their wages or benefits are not sufficient enough to meet their basic needs. With this extra money they can buy essential goods. Poor people will adopt another standard of living and they can maintain this situation as long as the central bank conserves the policy measure. But what will happen if policymakers shut down this distribution of 'free money'? On the one hand, some people who lived on the poverty line before will get out of this difficult situation because they received an additional allowance for a long period of time. This extra money will ensure new opportunities for these people. On the other hand, some poor people will end up in the same situation as before the measure. This can be dangerous because they have been able to afford more by this measure but eventually fall back on their original salary. They can thus no longer retain the elevated standard of living. Despite this danger these poor people will be happier overall because they have received additional financing during a specific period. This extra money provides opportunities to get out of their miseries even if only for the time the measure was in force. A potential risk that may arise is that unemployed people will be less motivated to find a job because they would receive an additional remuneration in the form of HM.

Another question we must ask is the following: should each person be given the same amount of money or not? The measures taken by the ECB apply to all countries within the Eurozone. Each country has its own culture, habits and economic characteristics. Because of this it is possible that the amount received by citizens could vary from country to country. Figure 4.1 shows the poverty rate for some Eurozone countries. As we can see, this poverty rate is higher for Greece (green stick) in comparison with Belgium (red stick). Using this example we can say that the amount of HM in Greece should be higher because there is more poverty in this country and thus more need for additional funding. However, if we take a look at figure 4.2 (household savings rate) we

can conclude that the amount of HM in countries such as Germany (blue) and Belgium (red) should be higher than in Greece (orange) in order to get the same result in terms of spending. This because the savings behavior of households is higher in these countries. However, we should be careful in our judgment because people might want to save more but are not able to do this. When 'free money' would be given to the public, people would be able to save more than we can conclude from this graph.





With these two figures we demonstrate that it is a difficult exercise to determine the right amount of 'free money' that needs to be given to consumers in the Eurozone. These parameters are just two of many factors that play an important role in the decision of the amount of HM. One main criticism can be given to this way of deployment, namely the discrimination against people from some countries. Even though this choice would be justified by various factors, people who receive less money than other citizens might feel discriminated.

Example 4.3

Suppose that the ECB decides to distribute money directly to households and that the citizens of country A receive € 100 and citizens of country B obtain € 300. People of country A might feel disadvantaged compared with people of country B, they receive an amount of money which is three times less. Because of the fact that people see each other as equal, they expect to acquire the same amount of money.

Theoretically it could be a responsible choice to distribute different amounts towards citizens but that does not mean that these people will understand this measure. A study on these kind of features needs to be done in order to define the proper amount of HM.

When policymakers decide to use some form of 'HM for households' it is important to get answers to these critical questions. A good study of consumer's behavior, savings and expenses for every community needs to be done as well as a debate on these various aspects of HM. This thesis will not conduct such a research because we focus on another

domain, namely the flow of the newly created funds. In the next chapter we will explain the purpose of our research and clarify our intent of the statistical part.

4.1.1 A check in the mail

One possible method to transfer newly created money to the public is to send checks to people in the community (*Kaminska, I. 2016*). By doing this, central banks hand over cash directly to consumers. These consumers are expected to spend this money, resulting in economic growth and an increasing inflation rate. Merchants can exchange these received checks for cash at the central bank. This method does not require any intervention of financial institutions, however, checks are rarely or not longer used in some countries. In Belgium checks have disappeared over time but in the US it is still a commonly used method of payment.

Besides all mentioned advantages and disadvantages above, there are some specific pros and cons about this particular tool. When depositing a check in someone's mailbox some dangers are involved, it can be that people lose their check or that some people will try to steal someone else's check. To counter this problem it is necessary to put the individual's name on the check so only he/she can make use of it. Another threat may arise when people try to manipulate this system to save the money. As already mentioned above, one of the main shortages of this method is that individuals are able to save the means instead of spending it on products and services.

4.1.2 A deposit into a bank account

A second method to transfer money to individuals is to deposit the funds into their bank account. Central banks can deposit the money in people's existing deposit accounts (at commercial banks) or they can create new savings accounts (at the central bank itself) and place the money on these accounts.

One benefit of this implementation would be that people can not lose the money they received, with a check or a voucher this is possible. Also, the possibility that people would abuse this instrument is smaller. A major threat of this method is the fact that people can save the amount of money they received and therefore the required investments and expenditures would not be realized. This problem can be avoided by providing each citizen with a new deposit account at the central bank instead of placing the money into their existing bank account with commercial banks. In this example, it would not be possible for people to transfer money from the bank account with the central bank to their own deposit account with the commercial banks. This implies that the money can only be used to pay for purchases. In order to control this implementation central banks could issue some kind of credit card which can only be used to make payments to merchants. By this way the public can only use these means to boost the economy and not to save the money at their bank account. Another possible feature of this implementation could be that the central bank resets the bank account each month. By doing this, people are in fact obligated to spend the money otherwise the remaining amount, which has never been in circulation, would disappear from the deposit account at the central bank. Resetting these accounts has no effect on the money stock in circulation and thus the permanence principle is not violated.

4.1.3 Vouchers

The last method of 'HM for households' would be that the central bank distributes vouchers, for example meal-vouchers or eco-vouchers. It is very similar to the first method (A check in the mail), the only difference is that this coupon can only be used for (a) specific product(s).

The same hazards as already mentioned in 4.1.1 can arise and in order to avoid them the receiver's name should be on the coupon. People are limited in the products they can buy with a specific ticket. If the central bank issues meal-vouchers consumers can only buy food with it. In this case it is not a problem because food is an essential good, everyone has to eat. However, all the means which would be distributed by central banks would end up in the same sector. In the situation of 4.1.1 and 4.1.2 people could spend the money as pleased, while in this case people can only buy specific products. When these coupons can only be used for electronic devices it might be a problem for some people if they do not need these products, maybe they want to buy other goods (not electronic devices). If we compare this to 4.1.2 (A deposit into a bank account), vouchers have the benefit that people cannot save some of the amount they receive. Consumers can only spend these means on products or services. Today, eco-friendly is an important concept in our modern society. In the case of eco-vouchers, it is possible to create a positive externality if these tickets are only suitable for the purchase of products that do no or minimal damage to the environment. Finally, by using these vouchers, it could be possible for authorities to stimulate certain important sectors which are facing difficulties.

In appendix 1.1 an overview of the most important pros and cons can be found concerning 'HM for households'. Appendix 1.2 lists the positive and negative issues concerning the other two types of implementation, namely 'HM through government institutions' and 'HM through the EIB'.

4.2 HM through government institutions

In the paper "What tools does the Fed have left? Part 3: Helicopter Money" written by Ben S. Bernanke (2016) an alternative way of implementing HM is discussed. Like already mentioned, the traditional view of helicopter money as Milton Friedman described is something imaginary. In this post of Bernanke the following 'definition' is being applied:

"In more prosaic and realistic terms, a helicopter drop of money is an expansionary fiscal policy – an increase in public spending or a tax cut – financed by a permanent increase in the money stock" (Bernanke, B. S. 2016).

This viewpoint opens new thinking on how to implement helicopter money. Instead of directly transferring money to the public, it could also be possible to use the government as an intermediary. In this paper Bernanke talks about a possible arrangement to implement this category of HM:

"Ask Congress to create, by statute, a special Treasury account at the Fed, and to give the Fed (specifically, the Federal Open Market Committee) the sole authority to "fill" the account, perhaps up to some prespecified limit. At almost all times, the account would be

empty; the Fed would use its authority to add funds to the account only when the FOMC assessed that an MFFP of specified size was needed to achieve the Fed's employment and inflation goals. Should the Fed act, under this proposal, the next step would be for the Congress and the Administration—through the usual, but possibly expedited, legislative process—to determine how to spend the funds (for example, on a tax rebate or on public works). Importantly, the Congress and Administration would have the option to leave the funds unspent. If the funds were not used within a specified time, the Fed would be empowered to withdraw them”.

If we generalize this concept of Bernanke central banks should open a bank account for the government and deposit newly created money into these accounts when it is needed. These means could then be used to increase public spending and/or to make use of a tax-rebate. Both options will be discussed in this section and will be based on literature and our own opinion and criticism.

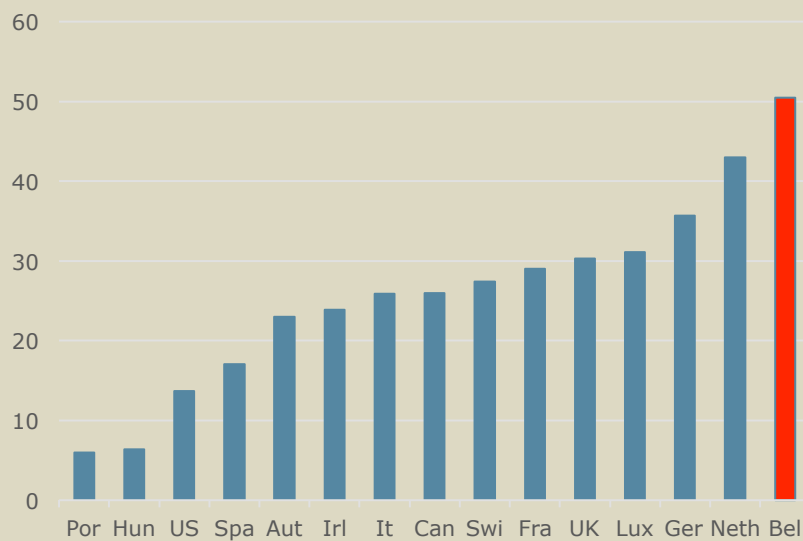
We also want to point out that those methods of implementation as explained in section 4.1 'HM for households' could also be used by the government. That is, the authorities could also decide to make use of checks, vouchers or they could deposit money into people's bank account. The only difference would be the fact that the government will act as an intermediary. It makes sense that these options will not be discussed again because their intention will remain the same.

4.2.1 HM – increase in public spending

Simply said, the central bank could decide to permanently increase the money stock by a certain amount and hand it over to the government. Three possible mechanisms to create and transfer these means to the governments exist and will be cited later this chapter (see section 4.5 Money creation). By using this money governments could increase their public spending. Through renewing infrastructure and through investing in other types of durable opportunities a better economic environment can be created. The OECD states the importance of a proper infrastructure as follows:

"Efficient transport infrastructure provides economic and social benefits to both advanced and emerging economies by: improving market accessibility and productivity, ensuring balanced regional economic development, creating employment, promoting labour mobility and connecting communities" (OECD, 2016).

Because of this it could become interesting to make use of HM in the form of increased public spending. To illustrate what is written above a small example will be given. By looking at figure 4.3 it becomes clear that the Belgian people lose quite some hours because of the traffic jams they face each day.

Figure 4.3 – Average hours lost in traffic jams (2014)

Source: Inrix

In 2004 Transport & Mobility Leuven conducted a study “Het Belgisch verkeer in cijfers” which states that in 2002 Belgian people lost 9 million hours because of traffic jams. The cost for this loss to the community was € 114 million, environmental impact not counted. An even more extreme study, conducted by Voka, projects the overall cost to the economy at € 500 million a year. The organization also mentions a study conducted by the OECD which points out that a better policy concerning mobility could result in a 2 percent points increase in economic growth (Voka, 2016).

Let us now suppose that the Belgian government is given an amount of money in order to increase public spending. If the government then uses this money to improve their road network the hours lost during traffic jams could be decreased. This would mean that trucks could drive more kilometers an hour and this would result in a higher profit margin. Also, people will spend less time on the road, making it possible for them to consume more and to invest this time elsewhere. Less hours lost during traffic jams also mean less frustrated, more happy and more productive people. This simple example makes it clear that by increasing public spending a better economic and institutional environment can be created. Also, by increasing the public spending jobs will be created. It makes perfect sense that in order to approve the road network contractors will be hired. These contractors may have to recruit new people in order to get the job done. A disadvantage could be the fact that the increase in employment will be temporary because these extra people may not be needed after the assignment is completed.

The above is just one simple example of what could be achieved by increasing public spending. Of course, lots of other investments could be thought of. If the government is able to find these interesting investments in association with the ‘free money’ offered by central banks economic growth and thus inflation should be able to rise. Larry Summers also agrees that increased public spending will strengthen both the economy and the government’s financial position. In his blog he discusses that also the IMF advocates increased public infrastructure spending (Summers, L. H. 2014).

Of course it is not that easy. Some problems of implementation could occur. First of all, not all central banks are legally allowed to interfere in fiscal policy. Also, their independence and the attitude of the governments have to be thought of. Further in this thesis these problems will be discussed.

4.2.2 HM – tax-rebates

Another possible way of distribution could be by conducting a tax-rebate. This type of HM is also briefly discussed in the same paper written by Ben S. Bernanke and is strongly related with section 4.1 'HM for households'. By using a tax-rebate the intention is the same, distributing money to the people. The only difference is the fact that in this situation money is distributed by the government towards the people instead of the central bank who is giving it directly to the public. Simply explained, the central bank provides financing for the government that can be used to fund their tax-income. How this distribution of money could be done will be explained in section 4.5.1. The part of taxes financed by the central bank can be used to give a 'tax-discount' to the people. By doing this, the public would get a tax-rebate when taxes are due. This money could then be used to consume and thus increase economic growth.

Where this type of implementation seems to be almost the same as just giving money to the public, one big difference does exist. When using a tax-rebate helicopter money is distributed indirectly to the public instead of directly. This could have some implications concerning the impact of HM. As already mentioned, there is one vitally important aspect when talking about HM and fiscal policy. It is of greatest importance that the public does know that the money they receive is something permanent. When introducing HM through a tax-rebate it is important that authorities make it very clear to the public that this money never has to be refunded. It is essential that the Ricardian Equivalence principle does not hold, this to optimize the effectiveness of HM. Another big difference compared to distributing money directly to the public is the fact that using a tax-rebate will ensure the central bank's independency in a greater way. That is, when deciding to directly distribute funds to the public it will be the central bank who has to decide who will receive money and how much. Instead, when using the government as an intermediary it is this fiscal authority that has to decide how to distribute the funds. The importance of independency could make 'HM through government institutions' somehow more plausible than using the direct way.

A key question that should be asked using this method is how big the tax-rebate should be in order to have an impact on the inflation level. Also, other criteria could make this type of implementation somehow difficult.

Two ways can be thought of when making use of a tax-rebate. It could be a total balanced system where each individual receives the same amount of money. For example a € 500 reduction in taxes. Another way could be to lower the percentages of taxes one has to pay. This way the reduction could be linked to the income one has reported. Where it does sound fairly simple, some 'roadblocks' are clearly present when making use of a tax-rebate.

Let us hypothetically assume that the government has decided to give each individual person a tax-rebate of € 500. Also, let us assume that the Ricardian Equivalence principle does not hold and that the people are fully aware of the advantage they are given.

Example 4.4

If person A, without the tax-rebate, would normally end up on a net tax payment of 0, he or she will now receive € 500 from the government. This money can be used to consume or invest as pleased by that person. Now let us assume person B who, without the tax-rebate, has to pay a net tax payment of € 1.100. After deducting the € 500, he or she still has to pay € 600 in taxes. It is more likely that this person has a different feeling than person A who received € 500 even though they were given the same amount of money.

The probability that person B will spend more money is quite small. If instead they had given the € 500 directly to this person, at a different moment in time apart from taxes, it would be more plausible for him to spend some extra money. Also, when using a tax-rebate it could be that people do not actually see it as a 'gift'. Because most people think they are paying too much taxes they see it more as a reduction and not as 'free money'. It makes sense that the probability of more consumption and investments could be higher when people actually see it as a 'gift' rather than a discount on their taxes. Also the fact that taxes are only due once a year could make it hard to make use of HM on a monthly basis. Of course this problem could be avoided when the government would make use of the implementation methods as discussed in section 4.1 'HM for households'. The only difference would be the government playing as intermediary.

As already mentioned, another way to make use of a tax-rebate could be by altering the percentages of taxes one has to pay. In this way, the reduction will be linked to the income one has reported. This would mean that not every single person would receive the same amount of money. Also, differences between countries concerning taxes exist which would make a system like this harder to implement. Altering the percentages of taxes one has to pay is a theoretical possible alternative. Though, we do not think this approach would be the most interesting one to use. This approach would actually mean that those who already have a high income would benefit more than those who have a low income. Because the intention of HM is to spur consumption, it could be more interesting to benefit those people with a low or an average income instead of those who are already 'wealthy'.

Obstacles concerning implementation through government institutions

Of course an implementation as described previously will not come without obstacles. Bernanke describes some difficulties concerning the implementation of HM. The first one refers to the integration of fiscal policy with standard monetary policy. Bernanke gives a solution to this problem. Concerning the first implementation issue he states the following:

"... most central banks do not make monetary policy by choosing a fixed amount of money in circulation. Instead they set a target for a short-term interest rate and allow the money supply to adjust as necessary to be consistent with the target..."

The reason for this would be the fact that there exists a greater relationship between the economy and interest rates rather than between the economy and money supply (*Bernanke. B. S. 2016*). This means that much thinking has to go to the question on how much money has to be created. When distributing money directly to the public this issue should be of less importance. In this way the central bank could decide to hand over a monthly amount of money to the people as long as necessary. The ECB could start the HM-program and continue doing it until they think the economy is back on track. Though, it has to be noticed that once the ECB would decide to stop the HM-program the possibility exists that people became dependent on these extra funds they were given each month.

Secondly, by using 'HM through government institutions' the risk of independency of the central bank and a lax government may exist. When the ECB starts interfering with fiscal policy the risk of losing independency is real. Though, the loss of independency should be smaller compared to distributing money in a direct way. By using the government as intermediary the decision on how to allocate the funds lies with the governments instead of the central bank. When distributing money in a direct way to the public this decision would have to be made by the central bank itself and thus it would lose more of its independency. This would also mean that technocrats get more power. In contrast, when the governments have to determine on the issue of allocation decisions are being made by a group of democratically elected people. Also, remember the previous chapter where we stated the following: "According to the statutes of the ECB monetary financing of public authorities (fiscal policy) is forbidden for central banks. This can cause a problem for the various ways HM can be implemented. An amendment would be necessary if one wants to change it." This indeed means that, concerning the ECB, statutes have to be altered before they can engage in this sort of policy.

Concerning the problem of a lax government 'HM through government institutions' would mean that authorities get access to 'free money'. This could be by, for example, selling non-interest bearing irredeemable bonds to the central bank. There actually might be some risks attached to this kind of implementation. One of these risks would be the fact that the government starts using the money for unprofitable investments. It is not hard to believe that some politicians would use this money in order to boost their reputation and to win votes for next elections. Of course, this is a problem that also applies to the government's everyday budget. Though, due to the fact that HM consists of 'free money' it could be that politicians will be more tempted to use these funds to boost their reputation. Therefore it is important to think about some rules or agreements in order to avoid this potential problem.

Also, until now it is unknown if helicopter money will ever become a reality and that is why governments are not counting on it. It is not hard to believe though that once the central bank decides to make use of it the governments are willing to believe that HM can be used again in the future. This actually could be one of the biggest risks HM could bring. If governments start to think that it is not a one-time deal they could become 'lazy', knowing that if economic problems would occur again the ECB will come and 'rescue' them by offering 'free money'. This means it is an important risk which has to be discussed further between the governments and the central bank in order to come to some agreements. This problem is also being discussed in Adair Turner's paper "The case

for monetary finance – An essentially political issue” (2015) where he emphasizes the risk of potential misuse of monetary finance⁴. The paper states the following:

“In democracies, electoral cycles create incentives for governments to reduce taxes or increase public expenditures ahead of elections, or to avoid necessary fiscal consolidation. These incentives can be offset by rules, norms or belief systems which constrain debt financed deficits. But if money financed deficits were an available option, they might appear a costless way out of this constraint”.

Adair Turner stresses that the main problem concerning helicopter money is political. The paper states that it is of vital importance that clear rules are set and institutions are designed to overcome the problem of misuse and dependency of HM by the governments. Therefore it could be better to clearly state that HM will only be used in extreme situations instead of making it an ordinary tool for monetary policy. This way reliance on HM by the governments could somehow be avoided. Later the thesis will further discuss this issue.

Another main obstacle concerning the implementation of ‘HM through government institutions’ can be thought of: the number of counterparties. When the central bank makes use of HM and distributes this money to fiscal authorities, these governments are the counterparties. In the US this implementation is not as complex as in the Eurozone because in the US there is only one counterparty. The ECB needs the cooperation of 19 countries to implement helicopter money, the Fed only needs to work with one administration. In the case of the ECB, this problem can be solved by making use of the EIB. In this situation the ECB only needs the collaboration of one counterparty. How this would work will be explained later.

Finally, another important complication that is most likely to occur is the problem of time lags. The time between the moment of perceiving something has to be done concerning fiscal or monetary policy and the moment that actions are made to influence the problem may be quite long. In the first place it will take a while to notice that the economy is not functioning as pleased. At that moment the ECB could decide that a monetary expansion is necessary. They can start working out a policy that is most likely to stimulate the economy. After the right policy has been determined the money stock can be expanded (let us assume in this example that money is given to the governments). When the government receives the money from the central bank they can start to decide how to organize this tax-rebate or increased public spending. Assuming a tax-rebate is being used, they can choose to hand out a fixed amount of money or opt for an altering in the percentages of taxes one has to pay. It has to be mentioned that when the government would choose the latter additional time will be lost in order to find a consensus for the questions ‘how’ and ‘how much’. When the government has come to a solution funds can start to flow to the public. From that moment people can decide whether or not and when to make use of the funds received in order to boost the economy. Reading the previous, it becomes clear that a lot of time gets lost before there can actually be an impact on the economy. The same goes for increased public spending where a lot of time can be lost in order to decide how to invest the money. Secondly, the projects

⁴ *“Monetary finance is defined as running a fiscal deficit (or a higher deficit than would otherwise be the case) which is not financed by the issue of interest-bearing debt, but by an increase in the monetary base – i.e. of the irredeemable fiat non-interest-bearing monetary liabilities of the government/central bank” (Turner, A. 2015).*

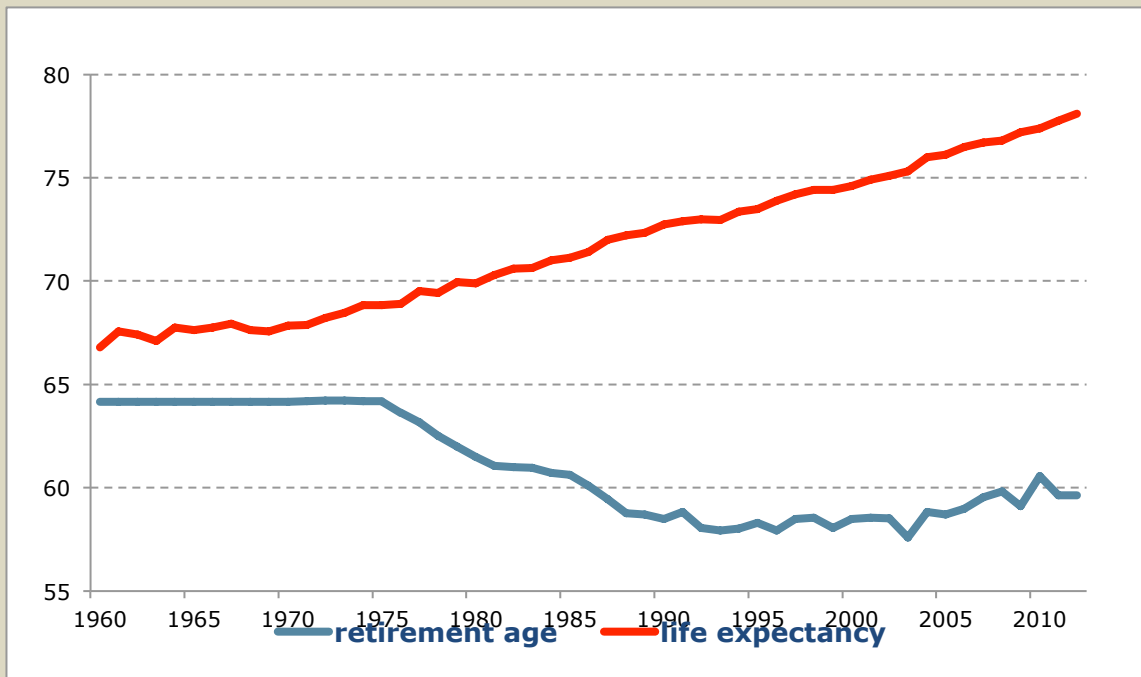
themselves could be very time-consuming. For example, improving the road network is not something that can be done overnight. It could be that the economic situation has already changed in a good or a bad way during this period, which could make the measures taken not accurate for the new situation. Therefore it would be interesting to reduce this time lag as much as possible. When the ECB would decide to directly hand over money to the public time could be saved.

Alternative thinking

The thesis discussed diverse ways of implementing HM through the government. The first part discussed the option of triggering the economy by increasing public spending through investing the money in profitable opportunities. An alternative way of increased public spending does also exist. Instead of investing in a better institutional and economic environment it could also be possible to use this money in another way. In the paragraphs below this alternative thinking will be discussed.

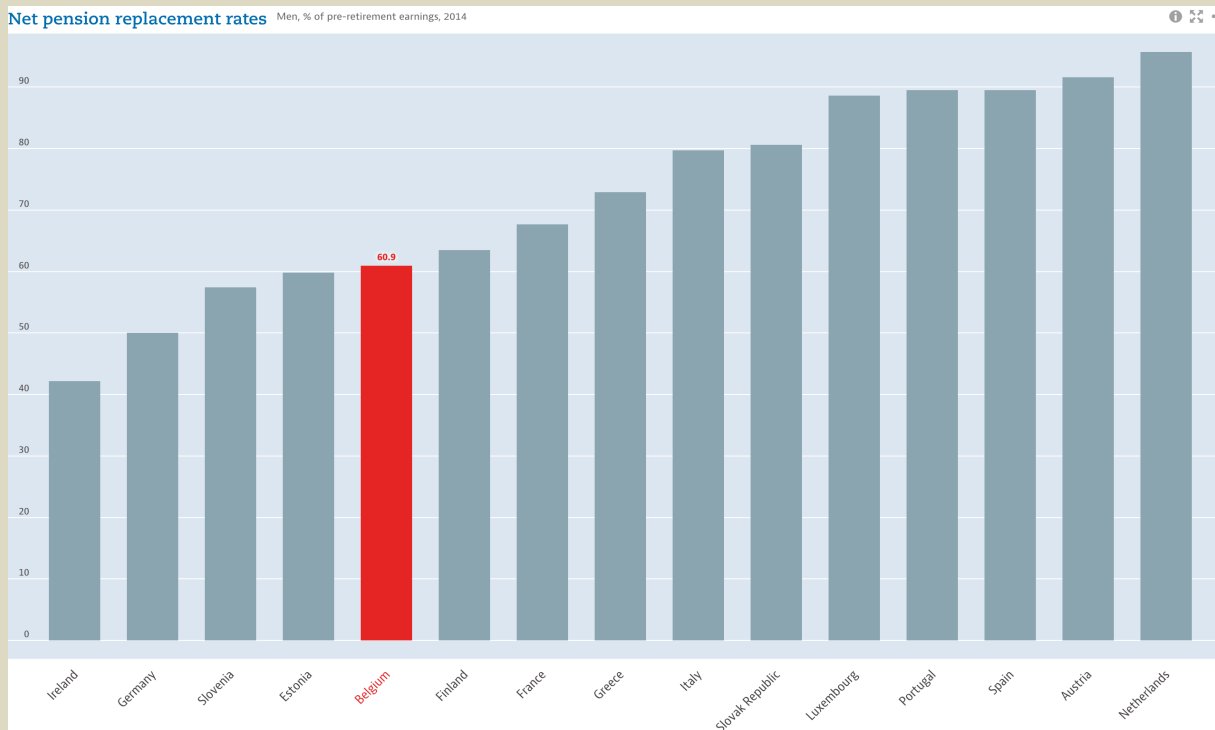
Figure 4.4 gives an indication of the life expectancy and retirement age of the Belgian people. It is clear that people tend to live longer but retire at a younger age. Figure 4.5 shows the effectiveness of the pension system and illustrates the percentage of state pension received in comparison with the pre-pension income. It becomes clear that an additional income or savings-buffer is needed for most people. This means that the public has to save more money when they are young in order to bridge this gap when they retire. This phenomenon can be linked to the theory of 'precautionary saving' which occurs when there exists uncertainty about future income. A reaction to this uncertainty would be to delay consumption now to create a reserve in order to retain a smooth path of consumption in the future (*Ziegelmeier, M. 2009*). Too much savings now means less consumption, means less economic growth, means less inflation.

Figure 4.4 – Belgian life expectancy & retirement age



Source: Eurostat, OECD

Figure 4.5 – Net pension replacement rates



Source: OECD

For those countries that have a low coverage ratio it could be interesting to reform their state pension. Belgium for example only covers 60.9 percent of the pre-pension income. Helicopter money could be used in order to make a promise to the public that a higher state pension will be received when one retires. This way people have to save less for the future and therefore can increase their consumption now.

4.3 HM through the European Investment Bank

The last possible way to implement HM is by making use of the European Investment Bank (EIB). The EIB is the European Union's nonprofit long-term lending institution. The member states of the European Union are the shareholders and this institution represents their interests. The EIB's operations are mainly financed by borrowing on the capital markets rather than drawing on the EU budget. They do not only provide finance for sound and sustainable investment projects which contribute to furthering EU policy objectives, but also deliver expertise. Their main priority is to support projects that contribute growth and employment to the European Union. As part of their counter-cyclical approach their activities focus on four priority areas: innovation and skills, environment and climate, access to finance for smaller businesses and infrastructure (*European Investment Bank, 2016*).

Using the EIB to realize HM is similar to 'HM through government institutions'. In this scenario the EIB will invest in good opportunities instead of the governments. Chowdhury and Islam (2014), amongst several other prominent economists, argue that the ECB can support these investments by buying EIB-bonds. This asset purchase program implicates that the ECB buys non-interest bearing irredeemable bonds of the EIB. This actually means that these bonds would not create any financial obligations. The central bank buys these bonds directly from the EIB and because they are non-interest bearing and irredeemable no obligations occur (see section 4.5 Money creation). By doing this, the EIB gets money from the ECB to invest in sound and sustainable projects, which would result in a contribution to growth and employment in the Eurozone.

An important benefit relative to 'HM through government institutions' is that there will be less opportunistic behavior by the authorities. The EIB will decide in which projects they invest, not the governments. The administration could do investments to win popularity and votes for the upcoming elections. Another advantage of this policy is that this method would be easier to implement from a political point of view. This because of the fact that the ECB buys EIB-bonds and the EIB can use this money to fund public investments. When HM would be implemented in the form of government interventions, it will create political risks when there are no legal or conventional barriers. Thus, the central bank and the administrations need to make credible commitments which define the conditions in which they will unfold monetary finance. Otherwise, this could lead to excessive use of this tool and abuse by governments. One can therefore conclude that this would be a difficult exercise. To overcome this issue the EIB offers a solution. If HM would be deployed through investments of the EIB the problem of the policy authorities would be bypassed. This because of the fact that the EIB is an independent institution and the individual governments have less to say in the EIB's investment policy.

In addition to these advantages, there is also often criticism about this policy because there are only a limited number of investments that can be financed by the EIB. In other words, these investments would not be sufficient to increase aggregate demand. In addition to the above, the EIB's intention was to invest € 60 billion over three years (€ 20 billion/year). However, since this 'Juncker plan' has been deployed only € 11,2 billion worth of projects have been done by the EIB. This can be an indication for a shortage of appropriate investment opportunities (*Claeys, G., Leandro, A. 2016*).

To counter these limited investments we can suggest some proper opportunities. With the present refugee crises in mind there has been much talking about checkpoints at the borders of the EU. This is an interesting idea that brings good financing opportunities with it. The EIB could invest in these checkpoints and in special EU security forces. Other suggestions could be to provide financing in order to create a unified EU energy market, a uniform railroad network and other investments in the Eurozone. By funding these kinds of opportunities economic growth and employment can be created which will lead to higher inflation. For instance, if the EIB tries to open the energy market, businesses and consumers throughout the European Union will have a free choice of supplier. In a more transparent market more suppliers will be present and this will result in lower prices which will be beneficial for all consumers. The reason why a unified EU energy market is essential is because the European Union is becoming more and more dependent on import of energy. Also, investments in pipelines, storage and new transmission electrical lines are essential (*de Palacio, L. 2003*). The EIB has already invested in projects which provide a social return and which contribute to the economy in general. One example of these investments is a power line across the Pyrenees.

"French and Spanish power grid operators have completed a long-awaited power line across the Pyrenees that will allow export of excess Spanish renewable energy and ease one of the worst network bottlenecks in Europe."

This project also allows the export of Spanish wind energy to other European countries. The investment results in lower energy prices by smoothing out cross-border peak demand. This is a major benefit for the economy and the communities in this region. Another example to emphasize the benefit of EIB financing is the investment in the Port of Antwerp, where they financed a new sea-lock. This opportunity contributed to regional industrial development significantly because of the added value in logistics and an increase in employment (*European Investment Bank, 2016*). These two examples demonstrate that the EIB's investments have a social return for the local communities and contribute to the welfare of consumers.

We ourselves, though, think that an implementation of 'HM through government institutions' is more interesting. This way more investment opportunities can arise and the possibility of transferring money to consumers exists. The fact that the EIB will be limited in their investment opportunities is a major obstacle. Also because very little literature on 'HM through the EIB' exists, the focus will be more on the other two types of implementation.

4.4 Overall difficulties concerning the implementation of HM

Till now the thesis has discussed some difficulties related to the manner of implementation. Also, more general implications could arise when talking about helicopter money. Most of these issues can be avoided but are still important to think about when deciding on how to implement HM. Therefore an overview of these implications will be discussed below.

It has already been mentioned that in the Eurozone financial institutions have to pay a 'fine' of 0,4 percent to deposit their reserves at the end of the day with the central bank. When the ECB would decide to implement some form of HM new money is created and pushed into the economy. Of course these funds will end up as a deposit at the commercial bank. The thesis already stressed out the impact of this negative interest rate to the profitability of financial institutions. When implementing HM, it is therefore important to think about this problem. When raising the money stock it will be more likely that banks will face more reserves at the end of the working day. This means that these financial institutions will face extra costs to park this money overnight with the central bank. It could be interesting to rethink this negative deposit rate in order to make sure that the financial institutions are not being pushed to their limits. In chapter 5 a profound analysis will be conducted concerning this topic. An example will be given to demonstrate the impact of the negative deposit rate for financial institutions and its implications concerning HM.

Another problem related to HM is brought forward in the paper written by Adair Turner, "The case for monetary finance – An essentially political issue". In our modern world financial institutions only hold a fraction of the deposits they receive as a reserve. By not using a 100 percent reserve system money is being created. This phenomenon is also known as 'the money multiplier' (*Van Overtveldt, J., Vanlaer, W. 2016*).

Example 4.5

Let us assume that financial institutions are obligated to hold 20 percent of deposits as a reserve. This means that when person A deposits € 1.000 with the bank only € 200 will be held in cash. The remaining € 800 can be lend to person B and so on. At the end the initial € 1.000 can lead to a total amount⁵ of $\frac{€ 1.000}{0,2} = € 5.000$.

Source: Van Overtveldt, J., Vanlaer, W. 2016

The previous example makes it very clear that it is important to take into account the money multiplier when making decisions about the amount of helicopter money that has to be created. The easiest way to avoid this phenomenon is to go to a system of 100 percent reserve banking. Of course, in our modern society this will not be the case. Another more logically solution to this problem is given by Adair Turner as he states the following:

"If banks are required to hold a given minimum percentage of total assets or liabilities in monetary base reserves at the central bank, and if that percentage minimum can be

⁵ We come to this amount by assuming no cash is being held by the public. It makes sense that when the public does hold some cash the multiplier will be lower.

increased by the central bank to offset unwanted credit and bank liability growth, then the eventual as well as the initial impact of monetary finance on aggregate demand can be constrained”.

He clearly states that by giving the central bank the ability to change this percentage of reserves the problem can be avoided. By increasing the required reserves a too large growth in money stock can be tempered and therefore a too large stimulus can be avoided. This also means that it is important to study in detail the amount of money that has to be created in order to give the economy a boost that is neither too low nor too high. When making this calculation it is thus crucial to bear in mind the fact that through the money multiplier, as discussed, the initial amount of money will enlarge on the long run.

Also, the reaction of the public concerning this alternative policy is of great importance. Therefore the public has to know that the increase in money stock is permanent and that no strings are attached regarding the money they receive. When this is the case there should be no reason to believe that the Ricardian Equivalence principle would hold. Nevertheless, even when the public does know that there are no future costs attached to this type of policy it can still be seen as a very drastic measure to boost the economy. That is, people are not used to receive ‘free money’ and it can thus be seen as a last resort to save the economy. This attitude could lead to an even bigger savings boost where the public could anticipate on a severe economic outlook. Therefore it is important to take into account this potentially dangerous situation when deciding on how to implement HM. For example, when choosing to implement HM by increased public spending the danger of precautionary saving could be less than when money is directly distributed to the public. There could even be a difference between handing over the money directly or indirectly (tax-rebate) to the public. Although, when using the indirect way the Ricardian Equivalence principle could also arise.

In the above it has been mentioned that it is of great importance to make sure that the public does not see HM as something extreme. To avoid such a reaction the central bank could decide to introduce HM as a new tool for monetary policy that will or can be used more often in the future. Though we also mentioned the fact that governments could become dependent on HM or that they would somehow misuse the system. It is not hard to believe that when the governments know that HM becomes a standard tool for monetary policy they would somehow behave differently in times of economic crisis. This because they know that the central bank is likely to hand over ‘free money’. Therefore to solve this problem it would be more interesting not to make HM a standard tool for monetary policy, it should be made clear that HM will only be used in extreme situations. We can clearly see that a trade-off between both problems occurs. It is thus important to decide which problem takes the most risk in order to determine on how to implement HM.

When reading all the above, it becomes clear that helicopter money does not come without obstacles. However, for each of these problems solutions do exist in order to make the implementation possible. The biggest challenges of helicopter money would be the threat of political misuse and their dependency. Clear rules have to be created in order to make sure no opportunistic behavior will arise. Additionally, when choosing to directly or indirectly hand over funds to the public, it is of major importance to create a positive attitude towards this type of policy.

4.5 Money creation

Now we have discussed all the different methods of HM it is necessary to think about how the money could be created and how the transfer of these means could be done. For each category of HM ('HM for households', 'HM through government institutions', 'HM through the EIB') a different approach of money distribution exists. In this section we will visualize the transfer of the 'free money' in a simplistic way. The first approach is the vision of Adair Turner on the transfer of the newly created funds. The other two approaches, designed by ourselves, are based on the mechanisms Turner used in his paper. There is one critical comment we can give to these visions about the money transfer and that is the following: in existing literature one does not consider the wider implications of this money transfer. So far no discussion has been done on what happens after money is being transferred to the public. The implications of these newly created funds stay unnoticed. That is why in chapter 5 we will visualize the money flow after the central bank has brought the funds in circulation and we will try to figure out the consequences HM entails.

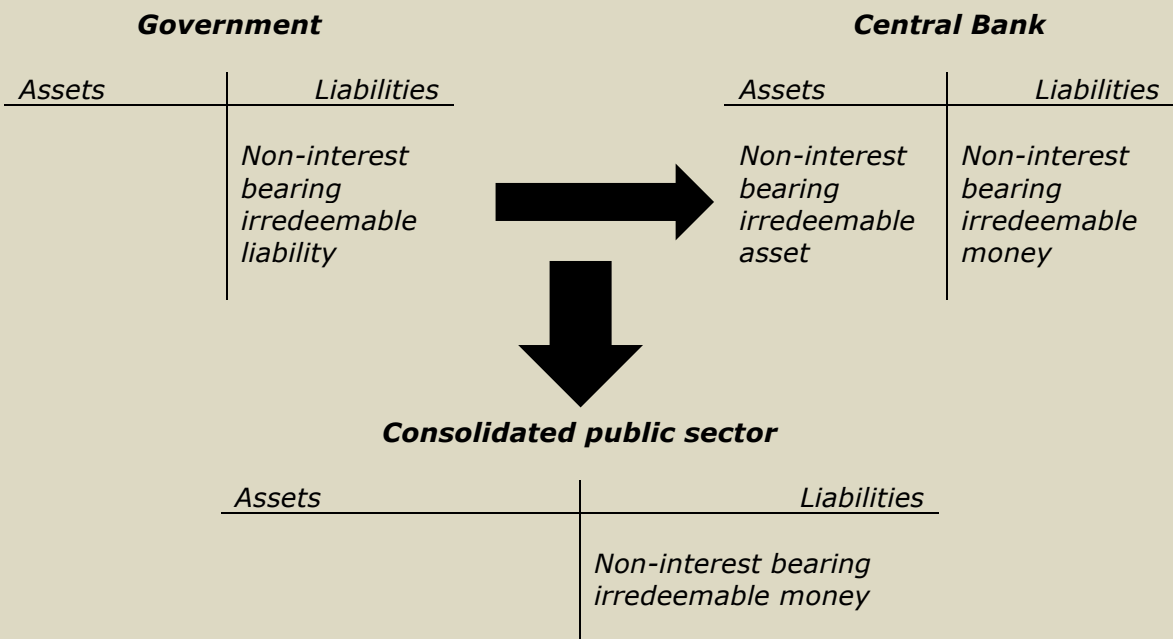
4.5.1 HM through government institutions

In order to provide the necessary funds for governments to increase their public spending Adair Turner considers in his paper "The case for monetary finance – An essentially political issue" the following three mechanisms:

- *"the central bank directly credits the government current account and records as an asset a non-interest-bearing non-redeemable "due from government" receivable (option 1);*
- *the government issues interest-bearing debt, which the central bank purchases and which is then converted to a non-interest-bearing non-redeemable "due from government" asset (option 2);*
- *the government issues interest-bearing debt, which the central bank purchases, holds and perpetually rolls over, returning to the government as profit the interest income it receives from the government (option 3)".*

How these three mechanisms work is shown in figure 4.6 and figure 4.7.

Figure 4.6 - Public sector balance sheets after money finance




Option 1: CB directly credits government current account with money which government spends
 Option 2: Government issues interest bearing debt which CB purchases and converts to non-interest bearing irredeemable 'due from government'

Source: Turner, A. 2015

Figure 4.8 - Consolidated balance sheets of government and central bank

Government		Central bank	
Assets	Liabilities	Assets	Liabilities
Value of future tax revenues	Bonds held by the CB (1)	Government bonds (1)	Equity Capital
Account at CB (2)	Bonds held by the public	Other assets	Reserves
Other assets	Other liabilities		Currency (cash in circulation)
			Government's account (2)
			Other Liabilities



Consolidated balance sheet

Assets	Liabilities
Value of future tax revenues	Equity Capital
Other assets	Reserves
	Currency (cash in circulation)
	Other liabilities

Source: Cecchetti, S. G., Schoenholtz, K. L. 2016

However, we have to remark that neither the ECB nor the Federal Reserve can buy securities directly from the governments. This is emphasized by the Federal Reserve Board (2013):

"The Federal Reserve Act specifies that the Federal Reserve may buy and sell Treasury securities only in the "open market." The Federal Reserve meets this statutory requirement by conducting its purchases and sales of securities chiefly through transactions with a group of major financial firms--so-called primary dealers--that have an established trading relationship with the Federal Reserve Bank of New York (FRBNY)".

The Treaty on the European Union and Treaty on the Functioning of the European Union (2012) provides a similar constraint, article 123 says:

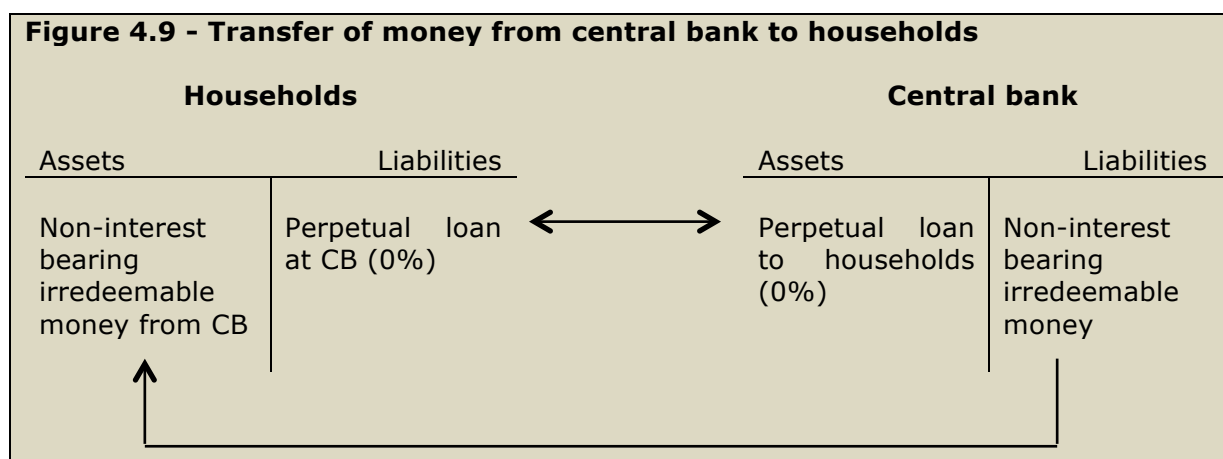
"Overdraft facilities or any other type of credit facility with the European Central Bank or with the central banks of the Member States (hereinafter referred to as 'national central banks') in favour of Union institutions, bodies, offices or agencies, central governments, regional, local or other public authorities, other bodies governed by public law, or public

undertakings of Member States shall be prohibited, as shall the purchase directly from them by the European Central Bank or national central banks of debt instruments”.

These constraints counter the direct money supply by central banks towards governments. Helicopter money requires cooperation between policy authorities (central banks and governments) and therefore adjustments to the present statutes.

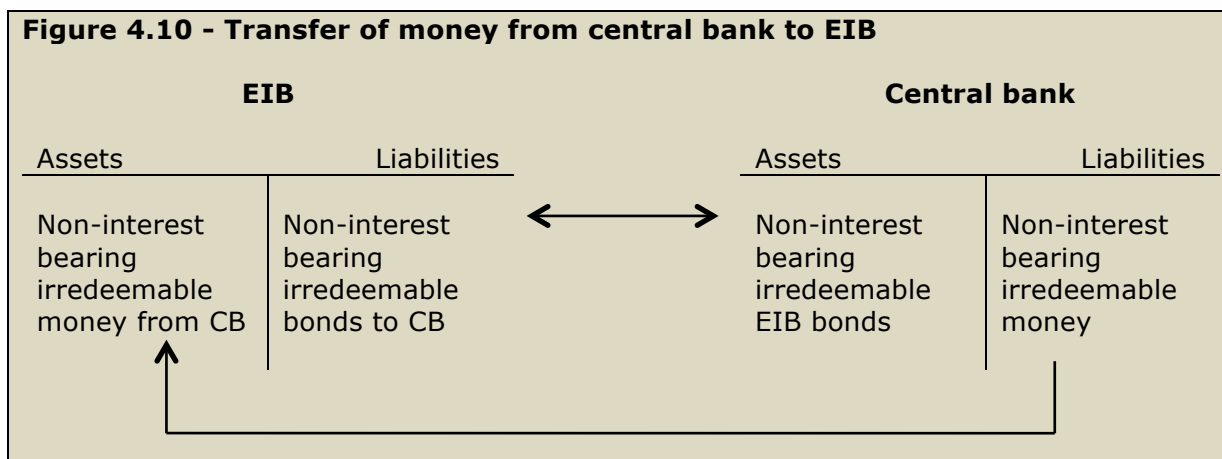
4.5.2 HM for households

As stated before, the most obvious way to transfer money to households implies a perpetual loan at a zero interest rate. This means that households receive an amount of money from the central bank for free. In the case of an ordinary loan one has to pay interests and has to repay the principal over time. However, a perpetual loan at a zero interest rate results in an everlasting obligation towards the central bank whereby one has to pay nothing. In other words, people receive money from central banks in exchange for 'nothing'. For each three alternatives of 'HM for households' a simple overview of how this transfer works is given in figure 4.9. This figure, designed by ourselves, is based on the mechanisms of Turner which are explained in section 4.5.1.



4.5.3 HM through the European Investment Bank

The final method of HM implies an asset purchase program of the ECB where they buy non-interest bearing irredeemable bonds of the EIB. In exchange for these bonds the EIB receives non-interest bearing irredeemable money from the ECB. After this transfer, shown in figure 4.10, the EIB is able to invest these 'free' funds in sound and sustainable projects in order to stimulate economic growth and employment in the Eurozone. Also this figure, designed by ourselves, is based on the mechanisms of Turner which are explained in section 4.5.1.



We now have seen how the transfer of helicopter money works, however, these figures are not the final destination of the newly created money. In the next chapter we will examine the further flow of these means in order to give a proper and justified conclusion about the possible implementation of helicopter money.

4.6 Chapter summary

In the previous sections we have discussed some different methods of HM and how they could be implemented. For each mechanism we have examined the most important advantages and disadvantages. A list of all these pros and cons can be found in appendix 1.1 and 1.2. We distinguished three different categories, namely 'HM for households', 'HM through government institutions' and 'HM through the European Investment Bank'. The first category includes three forms of HM (a check in the mail, a deposit into a bank account and vouchers) and ensures that the money goes directly to consumers. The second group, 'HM through government institutions', exists of three possible designs (an increase in public spending, a tax-rebate and the methods of 'HM for households'). Money goes from the central bank to governments which can use these means to invest in government projects or to distribute this 'free money' to consumers in an indirect way. The final category of HM uses the EIB as an intermediary in order to achieve economic growth and an inflation rate of about two percent.

By making use of 'HM for households' money could go straight to the public. When implementing HM this way no time lags would occur in which the impact on the overall economy could be more rapid. The fact that it is more likely people will see these funds as actual 'free money' (compared with a tax-rebate) could give more assurance that the funds will actually be used to boost the economy. Also, the fact that the funds will end up in all different sectors could make this type of policy very effective. Though, it has to be clear that the perception of seeing it as an extreme situation is real. This could lead to too much savings which could downsize the impact of HM as hoped for. Other than the danger of money actually being saved instead of boosting the economy, this type of implementation seems plausible to have a positive effect. Though its potential looks very interesting in theory some problems concerning the implementation could arise. That is, introducing HM this way would mean that central banks would lose too much of their independency. Where it would be up to them to decide on the issues about who will

receive money and how much will be distributed. Also, it could be very difficult or even impossible for the central bank to create a bank account for each individual person, this we have illustrated with the possible constraints concerning IT-resources. It could even get more difficult when the central bank would decide to, for example, make use of coupons. It could take a lot of time and effort in order to deliver these coupons to the people in the Eurozone.

Secondly, an analysis of 'HM through government institutions' has been conducted. The most interesting way of distributing newly created funds to the government would be by opening a bank account for the fiscal authorities as described by Bernanke. By making use of this approach the central bank would have to decide whether or not a monetary boost is necessary to get the economy back on track. In order to access these funds special rules or procedures could be implemented, this to reduce the risk of misconduct by the governments. Besides the legal issue concerning central banks and the construction of special rules and procedures, this type of implementation may actually be the most plausible way of introduction and has therefore our preference.

Finally, the thesis briefly discussed 'HM through the EIB' where it became clear that an implementation in this way could also be a possibility. Nevertheless, because of the limitations concerning investments this topic has not been further examined.

The reason why we think 'HM through government institutions' is most acceptable has several arguments. First of all, when making use of this type of HM the risk of losing independency by the central bank is smaller than using the direct distribution of funds. In this fashion the only decisions the central banks have to make is to determine whether or not monetary expansion is necessary and by how much. When they decide that an expansion is necessary they only have to deposit the funds into the newly created treasury accounts. Decisions on how to use this money will have to be decided by the governments themselves (after some rules are being followed). Also, the fact that a democratically elected government makes these decisions is more correct, instead of unelected technocrats (central banks) to decide on this issue of allocation. A second advantage would be the fact that each individual country is different in which it will have its own strengths and needs. Where it could be interesting to make use of a tax-rebate in one country, it could be more advisable to make use of increased public spending in the other. It also makes perfect sense that the governments themselves have better knowledge about the needs concerning their country compared to the central bank. For example, the government should be more informed about potentially profitable investment opportunities. Also, when making use of a tax-rebate they should be able to make better decisions regarding the allocation of these newly created funds to each individual person. Another important advantage when making use of 'HM through government institutions' is the fact that when the funds are being used in order to improve the economic environment the positive effects could last longer. This because the economic system as a whole has been improved in which the economy can grow. Finally, when making use of increased public spending more certainty exists that the money will actually be spend in comparison to handing over money to the public. Besides these positive effects, the problems of time lags, depending and misbehaving governments, etc. still exist.

This thesis had the initial intention to answer questions concerning 'how much money should be distributed to the public?', 'who should receive funds?', 'does everyone get the same amount?', etc. As we mentioned the idea of introducing 'HM through government institutions' by depositing a 'free' and permanent amount of money, these questions have become a fiscal matter. The decision on how to allocate these funds will be up to the governments themselves. That is, the actual usage of these funds does not concern monetary policy anymore. Where this thesis only focuses on monetary policy a discussion about how to actually allocate and use the funds received will not be further investigated in this study. On the other hand, it could be interesting to further investigate the question on how much funds should flow to each individual country in order to spur inflation. By making use of the output gap a country faces and by examining the fiscal multipliers predictions could be made concerning the amount of money that should be distributed. This kind of research we will conduct in the next chapter.

During this chapter we also discussed the issue concerning the creation of new funds. We already mentioned that the money circulation will go further than discussed in section 4.5 (Money creation). Previously, we stated several times that HM concerns 'free' and permanent money. In chapter 5 an analysis will be done in order to determine if HM actually is as free as discussed until now.

Chapter 5: Statistical research

As we stated in the summary of chapter 4, we prefer the option where central banks provide helicopter money for governments. This indicates that questions on 'which people would get money', 'how much should they receive', etc., has become a fiscal policy rather than a monetary policy and are in fact decisions for the fiscal authorities themselves.

The final focus of our research will be on the question whether helicopter money is actually 'free money' or not. This will be done by examining the flow of the newly created funds. As we have already demonstrated in the previous chapter, HM seems interesting and could actually become an alternative tool for monetary policy. Also, we mentioned that the money HM entails would be actually free but is this statement true? Perhaps a profound research about the money flow of HM could shed a different light on the case. This research will provide an overview of the balance sheets of all involved parties. By doing this we can provide a contribution to the existing research because current articles about this topic never mention this aspect. We will also give an example, this way we make these overviews of the balance sheets less abstract and easier to understand.

Secondly, we will investigate fiscal multipliers, the output gap and other important factors which are crucial concerning HM. In fact, these factors will be used in order to make some predictions about the amount of HM that should be created.

5.1 Balance sheets and money flow

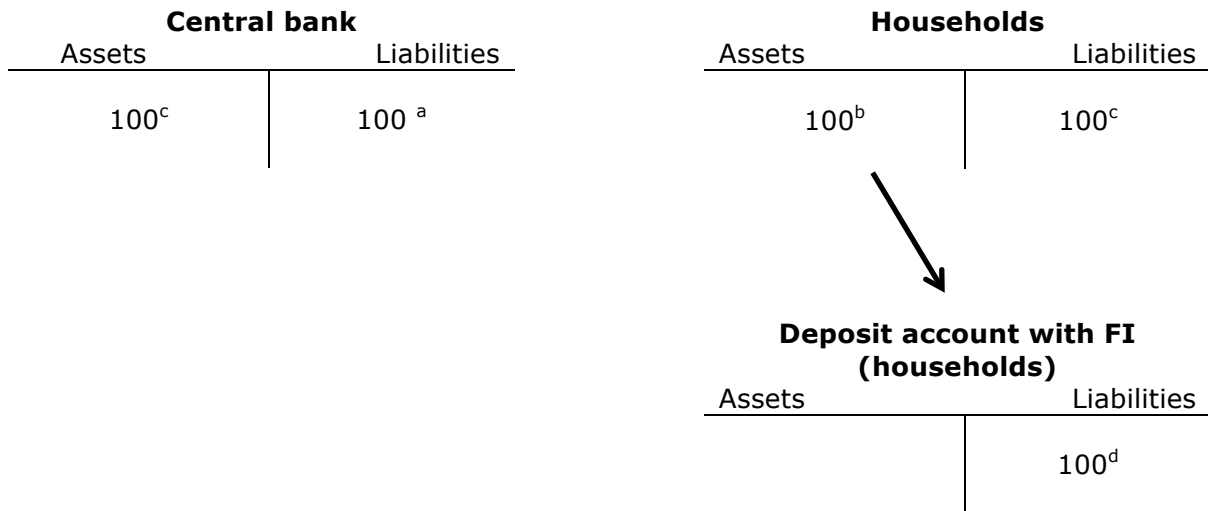
In existing literature one always talks about 'free money'. In the previous chapter we examined the money creation and how these newly created means can be distributed to households, governments or the EIB. We can ask ourselves the question whether helicopter money is actually free or not. Although this is an important aspect of HM it is never questioned before in existing literature. In this section of our thesis we will investigate this overlooked issue. We will visualize the flow of helicopter money through composing an overview of the balance sheets of the parties that are involved. We can give such an overview for each category of HM we have considered earlier. In the following three sections we make an abstraction of taxes because it will be easier to explain and to understand the figures we will visualize.

5.1.1 Money flow of 'HM for households'

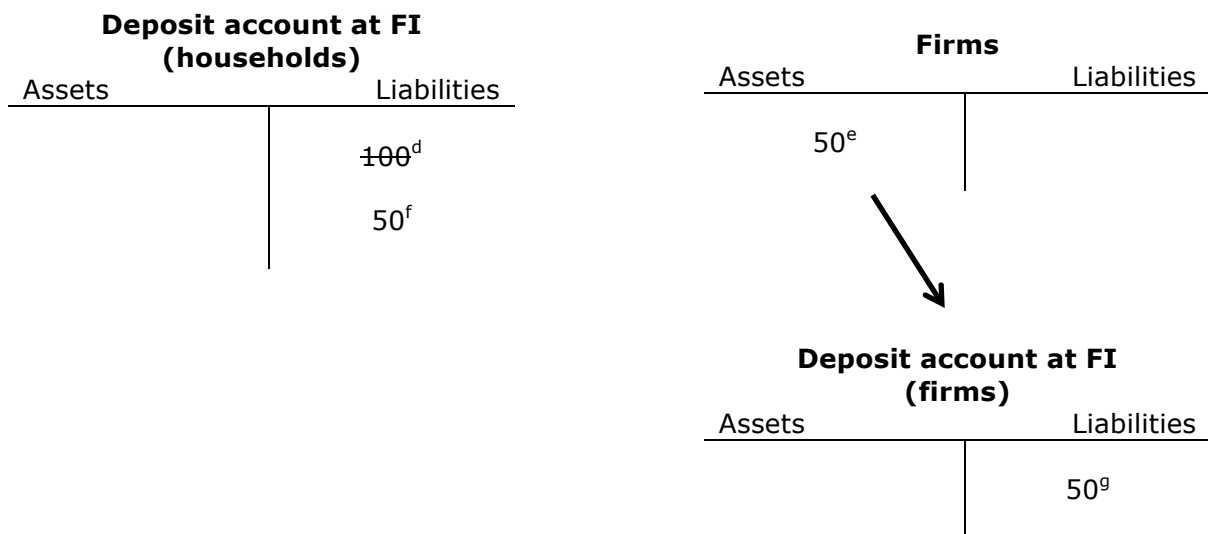
The first category of HM entails a direct distribution of the newly created money. Central banks can choose between three options to hand out these means: a check in the mail, a deposit into a bank account and a voucher. In order to visualize the flow of helicopter money we assume that people will receive the money on their bank account. We have already discussed in detail how the transfer of the funds can take place. In this case we would opt for a perpetual loan to households with a zero percent interest rate.

The first step in the process of helicopter money is the creation of new funds by the central bank. Let us assume that the monetary authority creates money to give each person € 100 (a). These means will then be distributed to consumers (b) by granting a

perpetual loan to households at a zero interest rate (c). This loan appears to be an asset to the central bank and a liability to households. However, this perpetual loan will not result in a direct cost for households because no interests or principal have to be paid. This € 100 distributed to each citizen will immediately end up in people's savings account with financial institutions (d).




People now have this € 100 in their possession which can be used in several ways. They can keep the helicopter money at their savings account or they can spend it. Let us assume that 50% of the helicopter money will be spent (e) and the other 50% will stay at people's bank account (f). To make it easier to understand this illustration we make the assumption that there are no cash withdrawals. In the case of consumption € 50 will flow to firms. The other € 50 will be held at a bank account. Because we made the assumption of no cash withdrawals, firms will receive the amount of € 50 into their own deposit account (g).



In this example firms receive 50% of the newly created funds that were distributed. These firms can now use this money to invest or keep it as a deposit into their bank account. Let us further suppose that they will invest 50% of the means and thus save the

other 50%. The € 25 used in order to invest will now flow to other firms, this process can continue. However, because of the assumption that no cash money is being held, the total amount of € 50 will always stay at the liability side of the balance sheets of financial institutions (g). In other words, the money invested by firms just flows from one bank account into another. Another assumption in this example is made for simplicity, namely that there are no salaries paid by firms towards households. If firms pay wages to households the latter can spend or save this money again. However, the total amount of helicopter money (the initial € 100) will end up with financial institutions (f+g). The funds that consumers and firms deposit at these institutions form a reserve for the latter (h). One important detail we have to mention is that we will not consider a money multiplier in this example because of simplicity.

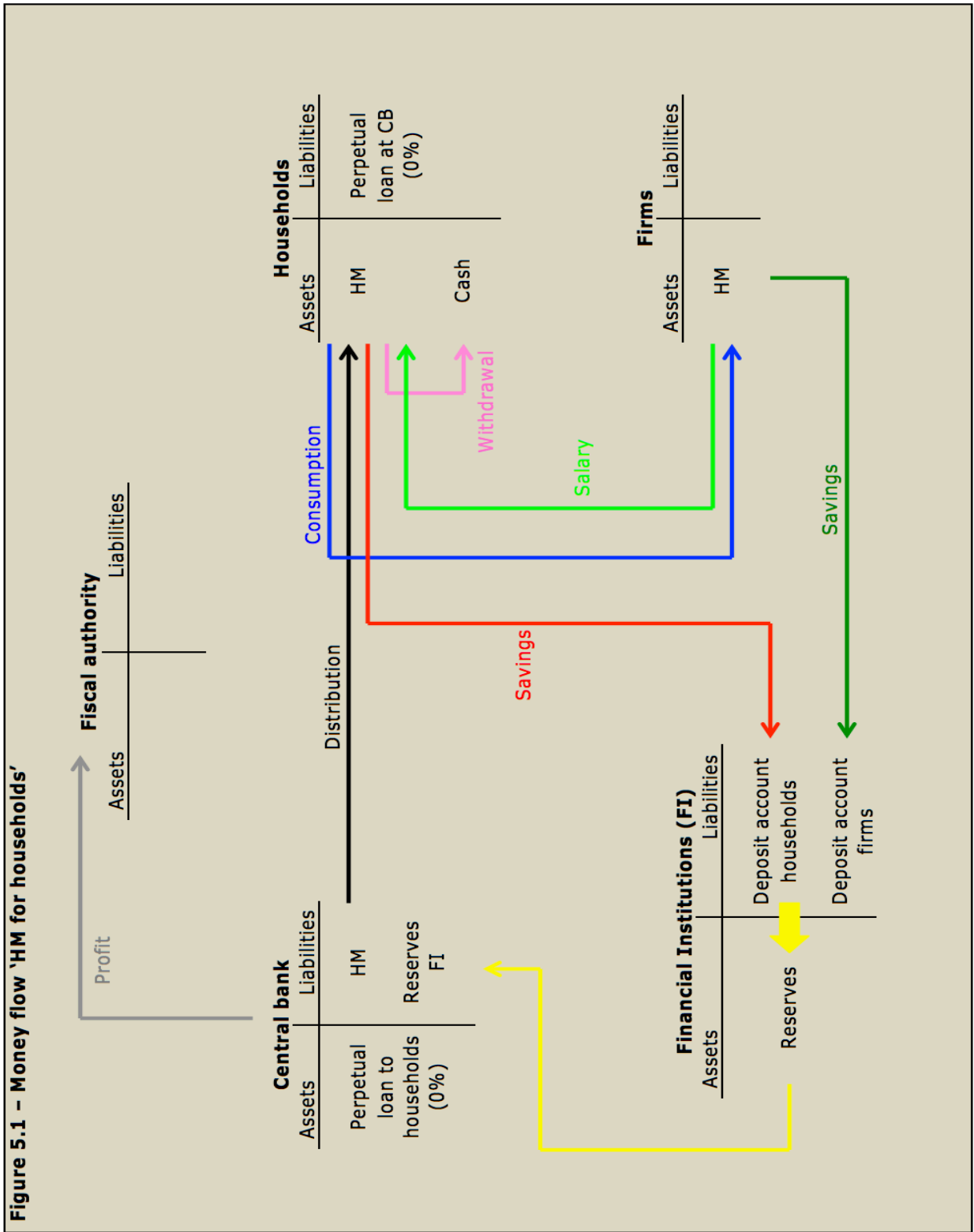
Deposit account at FI (households)		Deposit account at FI (firms)	
Assets	Liabilities	Assets	Liabilities
	50 ^f		50 ^g



Financial Institutions	
Assets	Liabilities
100 ^h	50 ^f 50 ^g

Because financial institutions are obligated to park their reserves overnight at the central bank the funds will be back at where they came from. In today's situation, the interest rate between financial institutions and the central bank (ECB) is notated at -0,4%. This means that commercial banks have to pay an interest when they deposit money overnight. In this case, these interests become a profit for central banks. Most of them are partially owned by governments and because of this fact these fiscal administrations will benefit from the interest being paid on helicopter money. However, in the opposite situation where financial institutions receive interests when depositing money overnight this would be a cost for the monetary authority. This we will discuss in more detail later this chapter.

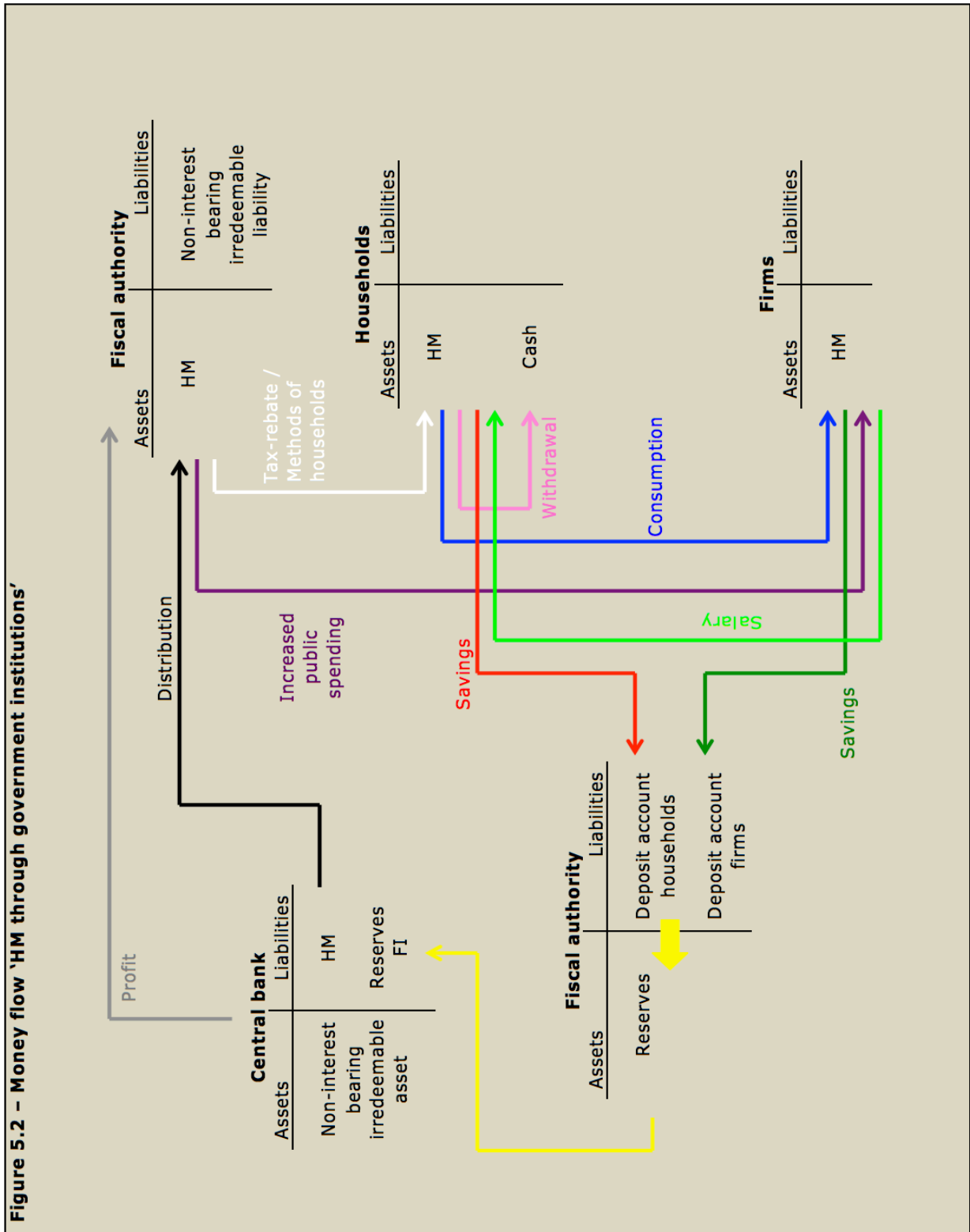
In figure 5.1 an overview of all the steps of the process of helicopter money is given. Here we show the steps of cash withdrawals and salaries we excluded from the example above. The increasing consumption of households and the expanding investments and salaries paid by firms will have a positive effect on the GDP. This will stimulate the economy and thus spur inflation.



5.1.2 Money flow of 'HM through government institutions'

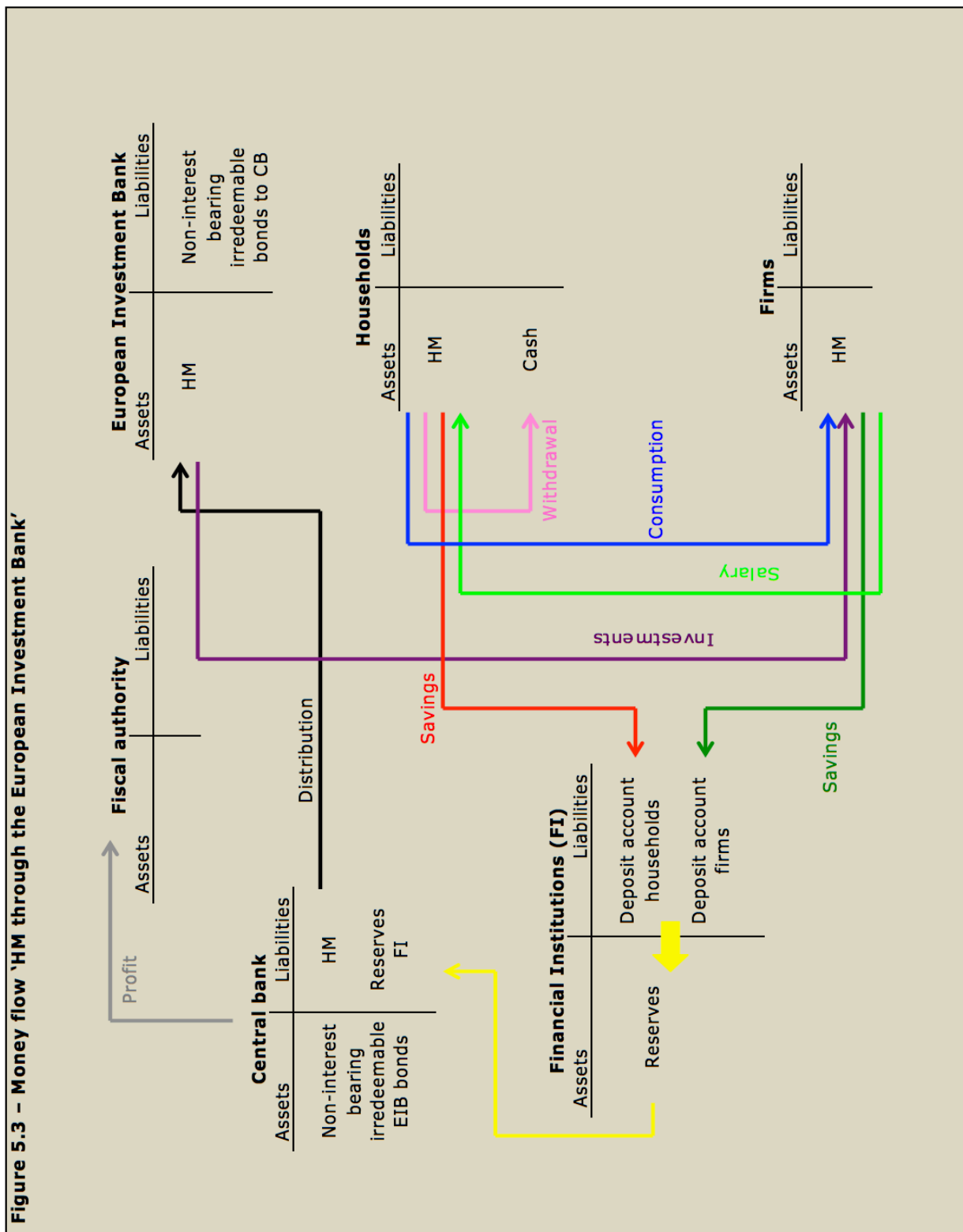
In the case that helicopter money would be distributed through government institutions, by opening a bank account at the central bank, the flow of the money is visualized in figure 5.2. First, the central bank creates new funds and distributes these to the government (black line). Then the administration can decide what to do with these means, from now on it is fiscal policy and no longer a monetary issue. They can opt for an increase in their public spending in which the money will flow to firms (purple line). The government can also choose to implement a tax-rebate (indirect distribution) or they can use the methods of HM for households: checks, a deposit into people's bank account or vouchers (white line). In case of a tax-rebate and the methods of 'HM for households', the same scenario as in 5.1.1 will occur. The outcome of this scenario is the same as the one of households, the only difference here is that there are more parties involved and the figure is just a little bit more complex.

The increased public spending of governments, the expanding investments, improved economic environment, the higher wages paid by firms and the rising consumption of households will affect the GDP of countries in a positive way and therefore spur inflation.



5.1.3 Money flow of 'HM through the European Investment Bank'

The third option to implement HM we considered is by making use of the EIB (see figure 5.3). The ECB would buy bonds of the EIB and the EIB would receive helicopter money in return (black line). This bond would be a non-interest bearing irredeemable bond and thus there is no obligation attached to this transaction concerning the EIB. They can use these funds to invest in sound and sustainable opportunities (purple line). By making these investments the money will flow to firms which in turn can be used to save (dark green line) or to invest. Because of the higher production businesses have to hire more workforces and have to pay more salaries (light green line). People can use this money to save (red line) or to consume (blue line). This will stimulate the GDP of countries and thus inflation will also rise. Of course, individuals are likely to withdraw cash from their bank accounts and hold this money at home (pink line). Again, this is a spiral that will continue. If we assume no cash withdrawals, the total amount of helicopter money will end up at the financial institutions as a reserve (yellow arrow). As we said before, these institutions have to deposit their reserves at the central bank in which the funds HM entails will be back at its starting point (yellow line). Eventually, if the central bank makes a profit and decides to pay out this profit to its shareholders a big part of it will flow to the fiscal authorities (grey line). The scenario for this category of HM is quite similar compared to the other two types.



5.1.4 Is helicopter money 'free money'?

By reading the above we get a better picture on how the newly created funds will circulate. Now, this thesis will make use of an example in order to determine the impact of this money circulation. Also we will try to determine whether or not HM is actually 'free money'.

Recently, ING bank (2016) conducted a study in which they investigated the effect of HM when the funds would end up with the public. Using this study and the balances we discussed in section 5.1.1 we will analyze the money flow and its implications. The study examined twelve different countries on what the citizens say they would do if they would receive € 200 each month for a period of one year. The people were also informed about the fact that the money does not have to be refunded and that no taxes should be paid on it.

The study pointed out that only 26% of the public would actually spend the money they were given. 52% would save or invest it, 15% would use the funds to lower their debt and the rest did not know what to do with this money. The highest spenders are the Italians, they would spend 38% of the money. Followed by Belgium, where 33% of the public would use most of the funds to consume.

It becomes clear that the spending percentages as discussed actually seem quite low. The study also discusses that one reason for this could be the public seeing HM as a drastic policy to boost the economy. This is something the thesis also discussed in previous chapters.

When we would follow the idea of handing over € 200 per person each month one year long, in Belgium this would mean a money creation of ± 22Bn⁶. Combining the study and the flowchart in figure 5.1 we will discuss the implications of such money creation. For simplicity we will assume that none of these funds are being held or withdrawn as cash and that no taxes have to be paid.

The first step would be for the central bank to create new funds. After distribution, these € 22Bn will appear on the asset side for households. Following the study of ING bank € 7.33Bn (1/3) will be consumed and appears on the asset side of the firms. The other € 14.67Bn will be saved and will stay at people's bank account. Note that the €7.33Bn will also directly be deposited into a bank account, the only difference here is that this part of the money is also being used in order to boost the economy. Due to the fact that demand rises firms are most likely to expand their production. This would mean that new jobs might be created. More people will earn a salary in which some of the HM funds will flow back to the consumers. Taking into account the marginal propensity to consume⁷, consumption will rise again and new jobs can be created. It becomes clear that this relationship between job creation, disposable income and consumption can be quite important in order to boost the economy and increase our GDP. This interaction between

⁶ We assume that each person above the age of 18 would receive € 200 each month for one year. For Belgium this would mean 8.982.329 people receiving € 2.400 (200 x 12). Total amount of money creation would be € 21.557.589.600. For simplicity we will round to € 22Bn.

⁷ The marginal propensity to consume or MPC gives an indication of the increase in consumption in relation with the increase in disposable income. This would mean that when disposable income rises with € 1 and MPC is 0.55, consumption will increase with 55 cents and 45 cents will be saved (Lipsey, R., Chrystal, A. 2011).

firms and consumers may actually be the most important factor concerning GDP growth. That is, the OECD mentions the fact that average household spending represents 60% of gross domestic product (*OECD, 2016*). This interaction between firms and households is also presented in figure 5.4.

Before continuing to the next step one issue has to be further discussed. The interaction between households and firms does not have anything to do with money creation. Money is just being transferred between both parties. What is happening here is the contribution to GDP growth. Each time an individual spends money GDP can grow. If these funds for example flow back to consumers in the form of wages a new contribution to GDP can be realized. This is something important when talking about fiscal multipliers, this will be discussed later on. The subject of money creation is something different and will take place when the money ends up at the financial institutions. Here money can be created in two different ways. The first way of money creation is the money multiplier as discussed in chapter 4. Another way money can be created is when the commercial bank decides to both debits a new loan for a customer but also credits this amount on his name (*Van Overtveldt, J., Vanlaer, W. 2016*). This is an alternative way in which money is being created but will not be further discussed.

It becomes clear that the funds will end up with the financial institution because we assumed that no cash money is being held. This would mean that if the banks would decide to lend this money back to the public the amount of money would grow. Let us for example assume that 20% of this total amount of € 22Bn has to be held as a reserve. The other 80% or € 17.6Bn can be lend out to the public. This would mean that an extra € 17.6Bn is being created by the money multiplier. Of course, this process can go further than this amount. Using the formula as discussed in chapter 4 (section 4.4) the € 22Bn could grow to $\text{€ } 22\text{Bn} / 0.2 = \text{€ } 110\text{Bn}$. It becomes clear that this is far more than initially created by the central bank. Therefore it is important to take into account this money multiplier in order not to boost the economy by too much. Of course we do have to mention the fact that we assume that no cash is being held and that banks are actually willing to lend out this much money. In previous chapters it has been mentioned more than once that banks are actually reluctant to lend too much to the public or that the problem could be that the public is not interested in getting a new loan. All this would mean that the total money multiplier would be lower in reality.

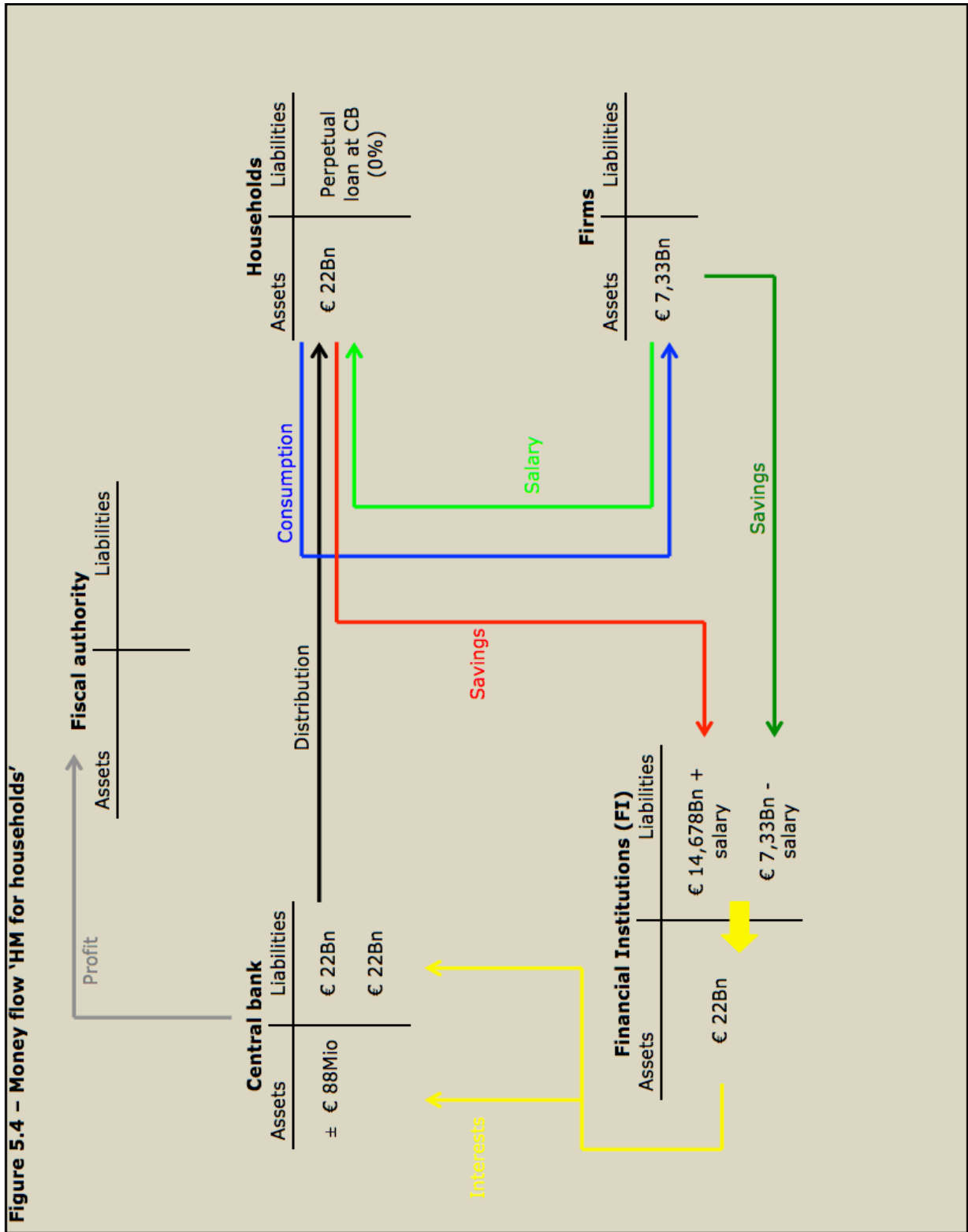
Returning to our initial example, the € 22Bn worth of HM has arrived on the liability side of the financial institutions. If we assume no money multiplier effects, let us consider that new loans are being financed by TLTRO's, the € 22bn worth of HM will have to be deposited overnight as a reserve at the central bank. This would mean that the cost concerning the financial institutions would rise quite fast. Remember that the cost to deposit money overnight with the central bank is notated at 0,4%. Where this percentage is notated per annum, a one day deposit would lead to a cost of $1,004^{(1/365)} - 1 = 0.0010937104\%$. This would mean that all financial institutions combined (where the funds are deposited) would have to pay $22\text{Bn} \times 0.000010937104 = \text{€ } 240.616,29$ for each night it is being held as a reserve. On a yearly basis this would be an average of € 88Mio. Of course, this would be if the commercial banks do not make use of the funds in an alternative way and no cash is being held by the public. Because of the fact that we do not take into account the money multiplier and because the assumption is made that all means will end up as a reserve makes this figure somehow biased. The main purpose of this example, however, is to demonstrate the magnitude of the negative deposit rate

these financial institutions face each day. It is the central bank that decides to increase the money stock but the financial institutions are the ones who will have to pay. Also, in Belgium financial institutions are legally obligated to pay a minimum interest rate of 0.11% on saving accounts (*Van Droogenbroeck, M. 2015*). This means that the cost for financial institutions which HM entails is 0,51% in the current situation. It becomes clear that the pressure on the commercial banks is getting quite high. In this situation it are the financial institutions who will have to pay the cost of a policy as HM. Of course, the minimum interest rate on saving accounts as mentioned is related to the Belgian law. It could be perfectly possible that no limitations on interest rates are being used in other countries. When no minimum rates exist the urge to allocate a part of the negative deposit rate to the customers becomes more plausible.

Concerning the previous paragraph, the cost for financial institutions will mean an income for the central bank. We already know that these central banks are partly held by the governments. This would mean that, when at the end of the fiscal year the central bank has made a profit it could opt to distribute some of these profits towards the fiscal authorities. In this situation HM could generate an implicit revenue in favor of the governments. Alternatively, in a more normal type of situation the central banks will have to pay the commercial banks an interest rate when depositing the HM funds overnight. That is, when the central bank has to pay an interest on these deposits the profits for the government will decrease which implicitly means that a cost is related to this alternative tool for monetary policy.

Conclusion

By reading the previous paragraphs it can be concluded that HM will always carry an implicit cost. When the deposit rate is negative, it are the financial institutions who will face increasing expenditures. These extra costs will put pressure on their profitability, which could lead to financial distress in the worst-case scenario. Alternatively, these financial institutions could opt to assign this negative rate to their customers in which people will pay the price of helicopter money. In the second scenario, where the deposit rate is positive, it will be the central bank that bears the cost of HM. This could also lead to less profit distribution toward the governments. It is clear that either way HM will never be totally free. The only situation in which the term 'free money' sounds more correctly would be when the overnight deposit rate which financial institutions face and the interest rates that these institutions charge towards their customers are both notated at zero percent.



5.2 Important factors concerning the magnitude of HM

In this section we will give an example where we examine how much helicopter money should go to a certain country by taking into account fiscal multipliers and the output gap. First we will explain both factors in order to understand their involvement concerning HM. Because this thesis has a monetary point of view, not a fiscal one, we did not compose these figures ourselves but collected them from reliable sources. Another important point to stress out is that these factors are estimates based on assumptions, therefore we should be cautious when interpreting these figures.

5.2.1 Fiscal multipliers

The first factor we will discuss is the fiscal multiplier. There are several methods to measure fiscal multipliers and to define this element. Generally, it is the ratio of a change in GDP or another output measure (ΔY) relative to a change in a fiscal variable (government spending or taxation, ΔG). In other words, it measures the effect of a € 1 change in a fiscal variable on the level of GDP or another output measure (*Ilzetzki, E., et al. 2010 and Batini, N., et al. 2014*).

$$\text{Fiscal multiplier} = \Delta Y / \Delta G$$

Example 5.1

If a € 0,50 increase in GDP (ΔY) is caused by a € 1 increase in government spending (ΔG) the government spending multiplier is:

$$\Delta Y / \Delta G = \text{€ } 0,50 / \text{€ } 1 = 0,5$$

In appendix 2 fiscal multipliers concerning different fiscal programs are given for a selected group of countries. These figures are composed by the OECD and date from 2008. The fiscal packages, which are used in this research of the OECD, include discretionary measures⁸ implemented and/or announced in response to the crisis up to March 2009. The 'reference estimates' take into account the situation of a recession, while 'high estimates' are adjusted only for 'openness' and will thus be more appropriate for today's situation. With 'recession' a period of general economic decline marked by high unemployment, stagnant wages and fall in retail sales is specified (*Lipsey, R., Chrystal, A. 2011*). People and business want to get their financial situation back on track. In other words, they want to lower their debt and thus will consume less. Openness refers to the degree of openness of economies to trade and is measured by the ratio of imports to GDP plus imports (*OECD, 2009*).

According to the findings of A. J. Auerbach and Y. Gorodnichenko (2013), spending multipliers in recessions are more effective than in expansions. Also, in today's situation we face the zero lower bound (ZLB) on nominal interest rates which also has some effect on the fiscal multipliers. Stefanie Flotho (2015) has done some research about this effect and she comes with the following conclusion:

⁸ Discretionary fiscal policy is based on the ad hoc judgment of policymakers as opposed to policy set by the predetermined rules. It implies government actions above and beyond existing fiscal policies, and often occurs in periods of recession or economic turbulence (*Auerbach, A. J. 2002*).

"Monetary policy is constrained by the zero lower bound (ZLB) on the nominal interest rate. These multipliers are not necessarily large under the ZLB constraint. However, compared with the fiscal multipliers when the central bank sets the nominal interest rate according to a Taylor rule, the multipliers under the ZLB are bigger. Moreover, the persistence parameter of the binding ZLB plays a crucial role."

With these two statements in mind, we should interpret these figures with caution. As is the case of today, we are not in a deep recession, however, we face the ZLB constraint. Thus the estimates of appendix 2 might deviate slightly from a better reflection of the reality. However, where it is not the aim of this thesis to determine the right amount of helicopter money, these figures will suffice to illustrate our intention. In our example we will use one-year high estimates because we use a one-year time period and because these estimates are closer to the reality (in comparison with reference estimates). By making use of the high numbers we also incorporate the caution which central banks would use when they would implement a mechanism as HM.

5.2.2 Output gap

A measure often used in economics is the output gap. This measure gives an indication of the GDP-level a country actually accomplishes to achieve and the potential GDP it could realize (*Van Overtveldt, J., Vanlaer, W. 2016*). It can be said that the prediction of potential GDP is somehow difficult to calculate. In this situation it is assumed that all production factors available in an economy are being used. These production factors could be for example land, labor, technology and capital. By assuming that these factors are all being used the potential GDP can be calculated. The formula to express the output gap is notated as follows:

Output gap = (actual GDP – potential GDP) / potential GDP.

A negative output gap would mean that not all production factors are actually used. Where we cannot assume these figures to exactly represent the reality, it though can be an interesting tool to use concerning HM.

In appendix 3 the OECD gives an indication of the output gap of some countries from 2010 until 2017. Those countries that face a negative output gap can use some stimuli in order to boost their economy. This because the negative output gap refers to an economy that is not running at full potential.

5.2.3 Example

In part 5.1.4 an example of the money flow has been given where money would be distributed to the public in a direct way. The example was based on a study conducted by ING bank, which stressed out that only one third of the distributed funds would be used in order to boost the economy. Two thirds of the money would just stay at the bank account of customers. These funds not only carry a cost concerning financial institutions, they also were not used at all in which there would be no contribution to the economy. Therefore it could be more interesting to implement HM trough government institutions. This way the fiscal authorities will have to decide how to allocate the funds received. When the government predicts that the public will be reluctant to spend the HM funds,

this money could be used alternatively. That is, when the fiscal authorities would decide to increase their public spending there would be more assurance that the money is actually being used.

To determine how to allocate the funds, besides the general knowledge of the government about their country and the public, the fiscal multipliers could also help in making decisions. If we take a look at appendix 2 we can see that, for example, a tax cut in Belgium has lower multipliers than in Italy. This could mean that for Belgium it could be more interesting to use the funds in an alternative way, for example making use of increased public spending or maybe as discussed in section 4.2.2 by reorganizing the pension system. Although, we have to keep in mind that the figures in appendix 2 are only very rough predictions and could be very different in practice.

Secondly, we mentioned the output gap. Where a prediction is being made about the potential GDP of a country. This measure, together with the fiscal multiplier, could be used to determine how much money should be distributed to each individual country in the Eurozone. An example can be found in table 5.4. Though, this measure should only be used with caution when determining the 'right' amount of HM. Reasons for this are that both the output gap and fiscal multipliers are hard to calculate and lot of assumptions are being made in order to obtain some figures. This will mean that the outcome will be biased. Also, in some situations it will not even be possible to make use of the output gap to determine the amount of HM. Germany, for example, has a predicted output gap of +0,373 for the year 2016 (see appendix 3). This would actually mean that the German economy is operating above its capacity. When using the output gap to determine the amount each country should get, Germany would end up with no additional money because the output gap states that this country is already at full capacity and a boost therefore would not be necessary. Nevertheless, Germany could also benefit from these 'free' funds. They could for example use this money in order to increase their public spending. When they achieve in improving their economic environment businesses could flourish and grow in this advanced infrastructure. All this could eventually result in an increased potential GDP.

A simple example is being given on how to estimate the amount of helicopter money for each country by making use of rough projections of fiscal multipliers and the output gap.

Example 5.2

We predicted that total GDP in Belgium for 2016 will be € 418,8Bn⁹. In combination with appendix 3 we can see that the output gap in 2016 would be -1,241% or € 5,197Bn. Let us further assume that the Belgian government wants to use all of these funds in order to increase their public spending to improve their economic environment. In appendix 2 we can see that for year one government investments have a multiplier of 0,7. This would mean that if we want to fill the output gap during the first year. The central bank should distribute € 5,197Bn / 0,7 = € 7,424Bn.

This simple calculation could be done for each individual country. Though, we do want to stress out that this is a very rough number based on a lot of assumptions in order to obtain some figures.

Concerning this example we can see that the amount of money that actually flows into the economy is quite similar to the amount of our example concerning ING bank. In this study € 22Bn had to be created but only 1/3 (€ 7.33Bn) would be used to consume. One big difference between both would be the extra cost for financial institutions when creating the € 22Bn. This because of the negative deposit rate financial institutions face.

Concerning this chapter we can conclude that making predictions about the amount of HM that should be used is not straightforward. All kind of difficulties and uncertainties exist when trying to make some form of calculations. Secondly, regarding chapter 5, we can conclude that 'HM through government institutions' may be the most plausible way of implementation. The main reason for this would be the fact that this way the government could decide to use the funds received to increase their public spending themselves. By using the government as an intermediary more certainty can go to the actual spending of funds. When the central bank would decide to directly distribute funds to the public the risk exists that this money will not be used effectively in order to boost the economy, as also discussed in the study conducted by ING bank.

At last we can conclude that it is not correct to state that HM is actually completely free. Where the explicit cost indeed can and will be zero, the implicit cost of HM does exist. In the situation of today in which the financial institutions have to pay a negative deposit rate HM does generate income for the central bank and thus for the fiscal authorities. This means that the commercial banks are paying the price of this alternative form of monetary policy. When we would return to a more normal situation in which financial institutions receive an interest on their reserves it will indeed be the central banks who will face the implicit cost of HM resulting in less profits for the governments. Therefore it is incorrect to define HM as 'free money'.

⁹ We estimated this figure by using an average growth rate of 1,93%. This by using data through the years 2012-2015 (*National Bank of Belgium, 2016*).

Conclusion

After reading the theoretical and statistical part of the thesis several conclusions can be made concerning helicopter money and an answer to our research question '*Could helicopter money be a good alternative for the current monetary policy?*' can be given.

During the theoretical part of the thesis we discussed that 'HM through government institutions' would be the most plausible way of implementation. By using this type of HM, the only decisions the central bank has to make is to determine whether or not monetary expansion is necessary and by how much. Once decided that an expansion is eligible newly created funds can be deposited into the treasury accounts. The fiscal authorities can then use these funds in order to boost the overall economy and to spur inflation. This way it would be the democratically elected governments to decide on how to allocate the money instead of the unelected technocrats. Other important reasons to opt for the government as intermediary were linked to the independency of central banks and the fact that governments have a better knowledge of their country in order to distribute the funds efficiently.

In chapter 5 our main focus went to the money flow and its implications. During this part we analyzed the question whether or not HM is actually 'free money'. To answer this question we evaluated each step of the money flow. At the end of this study we concluded that HM is not as 'free' as intended in most literature studies. We concluded that HM would always carry an implicit cost. In the situation as seen today it are the financial institutions who would bear this cost due to the negative deposit rate. In the opposite situation, when deposit rates concerning commercial banks are positive, it is the central bank who pays the cost. We were able to get to this conclusion by analyzing the balances as described in figures 5.1 – 5.3. The only situation in which the term 'free money' sounds more correctly would be when the overnight deposit rate and the interest rate financial institutions charge towards their customers are both notated at zero percent.

Finally, we want to give an answer to our research question: '*Could helicopter money be a good alternative for the current monetary policy?*'. Taking into account the previous chapters we can conclude with caution that HM could become a new tool for monetary policy. As discussed before, our preference would go to 'HM through government institutions'. With clear rules and a proper allocation of the funds it should be possible to boost the overall economy and to spur inflation. Though, we want to emphasize that there are still a lot of uncertainties concerning helicopter money. Where HM has never been used before it is hard to predict the actual impact HM would bring. Also, the reaction concerning the public and the governments remains unknown until actual implementation. Other difficulties would be related to the negative deposit rate and the fact that HM is not as 'free' as intended.

Therefore, theoretically helicopter money could be an interesting alternative for monetary policy. Although, its definition became slightly different because of the implicit cost HM entails. Also, it would be recommended to further investigate the potential impact of this measure before actually making it a new tool for monetary policy.

Reference list

- Allen, K. (2015). "QE feeding Europe house price bubble, says study", Financial Times. Retrieved October 10, 2016, from <https://www.ft.com/content/739a3700-2eeb-11e5-8873-775ba7c2ea3d>.
- Auerbach, A. J. (2002). "Is there a role for discretionary fiscal policy?", National Bureau of Economic Research.
- Auerbach, A. J. and Gorodnichenko, Y. (2013). "Fiscal multipliers in recession and expansion". National Bureau of Economic Research, vol. w17447, pp. 63-98. doi: 10.3386/w17447.
- Bank for International Settlements. (2011). "Basel III: A global regulatory framework for more resilient banks and banking systems".
- Batini, N., et al. (2014). "Fiscal Multipliers: Size, Determinants, and Use in Macroeconomic Projections", International Monetary Fund - Fiscal Affairs Department.
- Bernanke, B. S. (2005). "The Global Saving Glut and the U.S. Current Account Deficit", speech delivered for the Sandridge Lecture at the Virginia Association of Economists, Richmond. Retrieved November 30, 2016, from www.federalreserve.gov/boarddocs/speeches/2005/200503102/default.htm.
- Bernanke, B. S. (2016). "What tools does the Fed have left? Part 1: Negative interest rates", Brookings Institution, Bernanke's blog. Retrieved July 26, 2016, from <https://www.brookings.edu/blog/ben-bernanke/2016/03/18/what-tools-does-the-fed-have-left-part-1-negative-interest-rates/>.
- Bernanke, B. S. (2016). "What tools does the Fed have left? Part 3: Helicopter Money", Brookings Institution, Bernanke's blog. Retrieved July 7, 2016, from <https://www.brookings.edu/blog/ben-bernanke/2016/04/11/what-tools-does-the-fed-have-left-part-3-helicopter-money/>.
- Bloomberg Germany Sovereign Bond Index. (2016). "Running out of German Bonds to buy". Retrieved October 4, 2016, from <https://www.bloomberg.com/news/articles/2016-07-19/ecb-fast-exhausting-german-bonds-for-qe-buying-as-yields-tumble>.
- C.W. (2015). "Why negative interest rates have arrived - and why they won't save the global economy", The economist. Retrieved October 20, 2016, from <http://www.economist.com/blogs/economist-explains/2015/02/economist-explains-15>.
- Cassidy, J. (2016). "Raghuram Rajan and the Dangers of Helicopter Money", The New Yorker. Retrieved August 1, 2016, from <http://www.newyorker.com/news/john-cassidy/raghuram-rajan-and-the-dangers-of-helicopter-money>.
- Cecchetti, S. G., Schoenholtz, K. L. (2016). "A Primer on Helicopter Money", Money and Banking. Retrieved July 8, 2016, from <http://www.moneyandbanking.com/commentary/2016/6/27/a-primer-on-helicopter-money>.
- Chowdhury, A., Islam, I. (2014). "Growth and jobs in Europe: which way now?", VoxEU.org. Retrieved October 3, 2016, from <http://voxeu.org/debates/commentaries/growth-and-jobs-europe-which-way-now>.

- Claeys, G., Leandro, A. (2016). "Assessing the Juncker Plan after one year", Bruegel. Retrieved October 11, 2016, from <http://bruegel.org/2016/05/assessing-the-juncker-plan-after-one-year/>.
- de Palacio, L. (2003). "Speech - Challenges towards a unified European Energy Market", *European Commission*.
- Duchateau, S. (2016). "Risicobeheer in financiële instellingen".
- Ducrozet, F. (2016). "The ECB and the cap key question", Pictet. Retrieved October 10, 2016, from <http://perspectives.pictet.com/2016/07/01/the-ecb-and-the-capital-key-question/>.
- European Central Bank. "Targeted longer-term refinancing operations (TLTROs)". Retrieved July 26, 2016, from <https://www.ecb.europa.eu/mopo/implement/omo/tltro/html/index.en.html>.
- European Central Bank. (2015). "Capital subscription". Retrieved October 7, 2016, from <https://www.ecb.europa.eu/ecb/orga/capital/html/index.en.html>.
- European Central Bank. (2016). "Asset Purchase Programmes". Retrieved September 20, 2016, from <https://www.ecb.europa.eu/mopo/implement/omt/html/index.en.html>.
- European Central Bank. (2016). "ECB announces new series of targeted longer-term refinancing operations (TLTRO II)". Retrieved October 12, 2016, from https://www.ecb.europa.eu/press/pr/date/2016/html/pr160310_1.en.html.
- European Commission. (2012). "Treaty on European Union and Treaty on the Functioning of the European Union - Consolidated versions of the Treaty on European Union and the Treaty on the Functioning of the European Union", European Union. 2012/C 326/01.
- European Commission. (2012). "Treaty on European Union and Treaty on the Functioning of the European Union - Consolidated versions of the Treaty on European Union and the Treaty on the Functioning of the European Union. Protocol (No 4) on the statute of the European System of Central Banks and of the European Central Bank". 2012/C 326/01. Retrieved October 11, 2016, from <http://eur-lex.europa.eu/legalcontent/EN/TXT/PDF/?uri=OJ:C:2012:326:FULL&from=NL>.
- European Commission. (2015). "Globalisation". Retrieved July 27, 2016, from http://ec.europa.eu/economy_finance/international/globalisation/index_en.htm.
- European Investment Bank. "Antwerp's new sea-lock: big ships beat the traffic." Retrieved December 8, 2016, from <http://www.eib.org/infocentre/stories/all/2016-june-01/antwerps-new-sea-lock.htm>.
- European Investment Bank. "Connecting France and Spain: breaking records on the way." Retrieved December 8, 2016, from <http://www.eib.org/infocentre/stories/all/2015-february-02/connecting-france-and-spain.htm>.
- European Investment Bank. "EIB at a glance". Retrieved October 3, 2016, from <http://www.eib.org/about/index.htm>.
- Eurostat. "Belgian life expectancy & retirement age". OECD.

- Federal Reserve Bank of San Francisco. (February 6, 2004). "What are the tools of U.S. monetary policy?". Retrieved October 13, 2016, from <http://www.frbsf.org/education/teacher-resources/us-monetary-policy-introduction/tools/>.
- Federal Reserve Board. (2013). "Why doesn't the Federal Reserve just buy Treasury securities directly from the U.S. Treasury?". Retrieved October 13, 2016, from https://www.federalreserve.gov/faqs/money_12851.htm.
- Fehr, E., Goette, L. (2005). "Robustness and real consequences of nominal wage rigidity", *Journal of Monetary Economics*, vol. 52, no. 4, pp. 779-804. doi: 10.1016/j.jmoneco.2005.03.006.
- Fels, J. (2015). "No end to the savings glut", PIMCO. Retrieved November 30, 2016, from <https://global.pimco.com/insights/economic-and-market-commentary/macro-perspectives/no-end-to-the-savings-glut>.
- Fels, J. (2016). "Opinion: What if central banks were no longer independent?", *Market Watch*. Retrieved December 8, 2016, from <http://www.marketwatch.com/story/what-if-central-banks-were-no-longer-independent-2016-05-19>.
- Fischer, I. (1933). "The debt-deflation theory of great depressions", *Econometrica*, vol. 1, no. 4, pp. 337-357. doi: 10.2307/1907327.
- Flotho, S. (2015). "Fiscal multipliers in a monetary union under the zero-lower-bound constraint". *Macroeconomic Dynamics*, vol. 19, no. 6, pp. 1171-1194. doi: 10.1017/S1365100513000783.
- Friedman, M. (1969). "The optimum quantity of money", pp. 4-5.
- Hirsch, P. (2008). "Quantitative Easing", *Marketplace*. Retrieved from https://www.youtube.com/watch?v=ohKQP_wSO9k.
- Hüttl, P., Leandro, A. (2016). "Helicopter drops reloaded", *Bruegel*. Retrieved September 20, 2016, from <http://bruegel.org/2016/03/helicopter-drops-reloaded/>.
- Ilzetzki, E., et al. (2010). "How big (small?) are fiscal multipliers?", *Journal of Monetary Economics*, vol. 60, no. 2, pp. 239-254. doi: 10.1016/j.jmoneco.2012.10.011.
- ING bank. (2016). "Helicopter money: loved, not spent - Europeans doubt effectiveness of helicopter money", *SlideShare*. Retrieved November 17, 2016, from <http://www.slideshare.net/ING/helicopter-money-loved-not-spent>.
- Inrix. (2014). "Average hours lost in traffic jams".
- Joyce, M., et al. (2012). "Quantitative Easing and Unconventional Monetary Policy - an introduction", *The Economic Journal*, vol. 122, no. 564, pp. F271-F288. doi: 10.1111/j.1468-0297.2012.02551.x.
- Kaminska, I. (2016). "Koo on why helicopter money just won't work", *FTAlphaville*. Retrieved September 22, 2016, from <https://ftalphaville.ft.com/2016/07/27/2170980/koo-on-why-helicopter-money-just-wont-work/>.
- Kane, C. (2016). "Rates are more dangerous than you think". Retrieved October 10, 2016, from <http://fortune.com/2016/03/14/negative-interest-rates-european-central-bank/>.

- King, A. (2009). "Time Consistency". Retrieved September 30, 2016, from http://econlog.econlib.org/archives/2009/12/time_consistenc.html.
- Krugman, P. (2009). "The paradox of thrift - for real", The New York Times. Retrieved November 30, 2016, from http://krugman.blogs.nytimes.com/2009/07/07/the-paradox-of-thrift-for-real/?_r=0.
- Lipsey, R., Chrystal, A. (2011). "Economics", 12th ed. New York: Oxford University Press Inc, pp. 369.
- Lipsey, R., Chrystal, A. (2011). "Economics", 12th ed. New York: Oxford University Press Inc, pp. 663.
- Lonergan, E. (2016). "A brief reply to Paul Krugman on policy equivalence on HM - Brad Delong", Philosophy of money. Retrieved September 23, 2016, from <http://www.philosophyofmoney.net/a-brief-reply-to-paul-krugman-on-hm-ht-brad-delong/>.
- Merler, S. (2016). "ECB TLTRO 2.0 – Lending at negative rates", Bruegel. Retrieved October 5, 2016, from <http://bruegel.org/2016/03/ecb-tltro-2-0-lending-at-negative-rates/>.
- Mersch, Y. (2014). "Keynote speech by Yves Mersch". Retrieved October 10, 2016, from https://www.ecb.europa.eu/press/key/date/2014/html/sp141017_1.en.html.
- Moore, E. (2016). "The ECB, bond buying and the capital key", Financial Times. Retrieved October 10, 2016, from <https://www.ft.com/content/606724b0-74c5-11e6-b60a-de4532d5ea35>.
- National Bank of Belgium. (2016). "Quarterly and annual aggregates: gross domestic income". Retrieved November 18, 2016, from <https://stat.nbb.be/?lang=en&SubSessionId=d295597f-3c01-4b68-ae6c-204a86ee8dcc&themetreeid=-200>.
- OECD. (2009). "The effectiveness and scope of fiscal stimulus". OECD Economic Outlook, Interim Report March 2009. doi: 10.1787/eco_outlook-v2008-sup2-en.
- OECD (2016). "Household savings". Retrieved October 25, 2016, from <https://data.oecd.org/hha/household-savings.htm>.
- OECD. (2016). "Household spending". Retrieved November 16, 2016, from <https://data.oecd.org/hha/household-spending.htm#indicator-chart>.
- OECD. (2016). "Inflation (CPI)". Retrieved November 30, 2016, from <https://data.oecd.org/price/inflation-cpi.htm>.
- OECD. (2016). "Infrastructure investment (indicator)". Retrieved October 12, 2016, from <https://data.oecd.org/transport/infrastructure-investment.htm>.
- OECD. (2016). "Net pension replacement rates".
- OECD. (2016). "Output gap of the total economy". Retrieved November 30, 2016, from <http://stats.oecd.org/Index.aspx?QueryId=51655>.
- OECD. (2016). "Poverty rate". Retrieved October 25, 2016, from <https://data.oecd.org/inequality/poverty-rate.htm>.

- Pereira, R. (2003). "Understanding Asset Swaps." Retrieved December 9, 2016, from <http://www.yieldcurve.com/Mktresearch/LearningCurve/LearningCurve4.pdf>.
- Randow, J. (2016). "Europe's QE Quandary - Battles Over Bond Buying", Bloomberg. Retrieved October 2, 2016, from <https://www.bloomberg.com/quicktake/europes-qe-quandary>.
- Randow, J., Kennedy, S. (2016). "Negative Interest Rates - Less Than Zero", Bloomberg. Retrieved October 2, 2016, from <https://www.bloomberg.com/quicktake/negative-interest-rates>.
- Rosenberg, D. (2016). "Negative interest rates? Unlikely. Still, Investors can prepare". Retrieved July 26, 2016, from <https://tickertape.tdameritrade.com/investing/2016/05/negative-interest-rates-48730>.
- Ross, S. (2014). "How can inflation be good for the economy?". Retrieved July 26, 2016, from <http://www.investopedia.com/ask/answers/111414/how-can-inflation-be-good-economy.asp>.
- Statistical Data Warehouse. (2016). "Inflation rate (Eurozone)", European Central Bank.
- Summers, L. H. (2014). "Why public investment really is a free lunch", Financial Times, Larry Summers blog. Retrieved October 13, 2016, from <https://www.ft.com/content/9b591f98-4997-11e4-8d68-00144feab7de>.
- Thomson Reuters Datastream. (2016). "Interest rates".
- Thomson Reuters Datastream. (2016). "Private credit growth".
- Transport & Mobility Leuven. (2004). "Het Belgisch verkeer in cijfers". Retrieved October 6, 2016, from http://www.tmleuven.be/project/verkeersindices/200401_artikel.pdf.
- Turner, A. (2015). "The case for monetary finance - An essentially political issue".
- United States Congress. (1913). "Federal Reserve Act". Enacted: December 23, 1913. Retrieved September 20, 2016, from <https://www.federalreserve.gov/aboutthefed/fract.htm>.
- Van Droogenbroeck, M. (2015). "0,11% is minimumrente voor spaarboekjes". De Redactie.be.
- Van Overtveldt, J., W. Vanlaer. (2016). Macro-economie, pp. 11-13.
- Van Overtveldt, J., W. Vanlaer. (2016). Macro-economie, pp. 81-88.
- Van Overtveldt, J., W. Vanlaer. (2016). Macro-economie, pp. 87.
- Van Overtveldt, J., W. Vanlaer. (2016). Macro-economie, pp. 119-121.
- Voka. (2016). "Fileleed heeft geen vakantie". Retrieved October 12, 2016, from <https://www.voka.be/antwerpen-waasland/nieuws/2016/7/fileleed-heeft-geen-vakantie/>.
- Wren-Lewis, S. (2013). "Ricardian equivalence and political uncertainty", Mainly macro. Retrieved October 3, 2016, from <https://mainlymacro.blogspot.be/2013/02/ricardian-equivalence-and-political.html>.

Ziegelmeyer, M. (2009). "Analysis of the precautionary saving motive based on a subjective measure". Mannheim Research Institute for the Economics of Aging (MEA), University of Mannheim.

Appendix 1.1 - Pros and cons of all methods of implementation

Category	Method	Advantages	Disadvantages
HM for households	A check in the mail	<ul style="list-style-type: none"> ▪ Money goes directly to consumers ▪ No intervention of commercial banks ▪ Experience as free money is higher ▪ Better distribution among sectors ▪ Spend as pleased ▪ Tool can be used repeatedly ▪ Less time lags 	<ul style="list-style-type: none"> ▪ Incentives to save ▪ No certainty people will spend enough ▪ Central banks lose independency ▪ Stealing and abuse ▪ Check can get lost ▪ Reaction of people is unpredictable ▪ Different reactions across countries are possible
	A deposit into a bank account	<ul style="list-style-type: none"> ▪ Money goes directly to consumers ▪ No intervention of commercial banks ▪ Experience as free money is higher ▪ Better distribution among sectors ▪ Spend as pleased ▪ Money cannot get lost ▪ Less abuse, no stealing ▪ Tool can be used repeatedly ▪ Less time lags 	<ul style="list-style-type: none"> ▪ Incentives to save ▪ No certainty people will spend enough ▪ Central banks lose independency ▪ Reaction of people is unpredictable ▪ Different reactions across countries are possible ▪ Complex implementation concerning the creation of bank accounts with the central bank
	Vouchers	<ul style="list-style-type: none"> ▪ Money goes directly to consumers ▪ No intervention of commercial banks ▪ Experience as free money is higher ▪ Possible to promote eco-friendly products ▪ Useful for basic necessities ▪ Tool can be used repeatedly ▪ Less time lags 	<ul style="list-style-type: none"> ▪ Incentives to save ▪ No certainty people will spend enough ▪ Central banks lose independency ▪ Stealing and abuse ▪ Voucher can get lost ▪ Poor distribution among sectors ▪ Not spend as pleased ▪ Range of products is limited ▪ Reaction of people is unpredictable ▪ Different reactions across countries are possible

Appendix 1.2 - Pros and cons of all methods of implementation

Category	Method	Advantages	Disadvantages
HM through government institutions	Increased public spending	<ul style="list-style-type: none"> ▪ More reliable system, more certainty about spending ▪ Besides economic growth public infrastructure improves ▪ Increase in employment ▪ Ricardian Equivalence does not apply and thus the reaction of the public is of less importance ▪ More manageable approach ▪ Loss of central banks' independence is smaller than with a direct distribution ▪ No intervention of commercial banks 	<ul style="list-style-type: none"> ▪ Political misuse of funds is possible ▪ Lax governments ▪ Opportunistic behavior by authorities ▪ Time-lags will occur ▪ Less distribution among sectors ▪ Multiple counterparties ▪ More employment can be temporary
	Tax-rebates	<ul style="list-style-type: none"> ▪ Perception of dramatic situation will be less ▪ Could be easier to implement ▪ Different options of implementation are available ▪ Loss of central banks' independence is smaller than with a direct distribution ▪ No intervention of commercial banks 	<ul style="list-style-type: none"> ▪ Experience as free money is lower than with a direct distribution ▪ The Ricardian Equivalence principle may occur ▪ Time-lags will occur, and can be large ▪ Taxes only due once a year ▪ Not every citizen will receive money ▪ Multiple counterparties ▪ Lax governments
HM through the European Investment Bank		<ul style="list-style-type: none"> ▪ Less opportunistic behavior by authorities ▪ Politically more palatable ▪ EIB is an independent institution ▪ Loss of central banks' independence is smaller ▪ Only one counterparty ▪ No intervention of commercial banks 	<ul style="list-style-type: none"> ▪ Limited investment opportunities ▪ Time-lags will occur

Appendix 2 - Fiscal multipliers

Openness in 2008 ¹	Spending increases						Transfers to household						Tax cuts							
	Government consumption			Government investment			Year 1		Year 2		Year 1		Year 2		Year 1		Year 2			
	Ref.	High	Low	Ref.	High	Low	Ref.	High	Ref.	High	Ref.	High	Ref.	High	Ref.	High	Ref.	High		
USA	0.7	0.7	0.8	1.1	0.9	0.9	1.1	1.3	0.5	0.5	0.8	0.9	0.3	0.5	0.5	0.9	0.2	0.3	0.3	0.5
JPN	0.7	0.7	0.8	1.1	0.9	0.9	1.1	1.3	0.5	0.5	0.8	0.9	0.3	0.5	0.5	0.9	0.2	0.3	0.3	0.5
DEU	0.4	0.4	0.5	0.8	0.8	0.8	1.0	1.2	0.3	0.3	0.5	0.7	0.2	0.3	0.3	0.7	0.1	0.2	0.2	0.4
FRA	0.6	0.6	0.7	1.0	0.8	0.8	1.0	1.2	0.4	0.4	0.7	0.8	0.2	0.4	0.4	0.8	0.2	0.2	0.2	0.4
ITA	0.6	0.6	0.7	1.0	0.8	0.8	1.0	1.2	0.4	0.4	0.7	0.8	0.2	0.4	0.4	0.8	0.2	0.2	0.2	0.4
GBR	0.5	0.5	0.6	0.9	0.8	0.8	1.0	1.2	0.4	0.4	0.6	0.8	0.2	0.4	0.4	0.8	0.2	0.2	0.2	0.4
CAN	0.5	0.5	0.6	0.9	0.8	0.8	1.0	1.2	0.4	0.4	0.6	0.7	0.2	0.4	0.4	0.7	0.1	0.2	0.2	0.4
AUS	0.6	0.6	0.7	1.0	0.9	0.9	1.1	1.3	0.4	0.4	0.7	0.8	0.3	0.4	0.4	0.8	0.2	0.3	0.3	0.5
AUT	0.3	0.3	0.4	0.7	0.7	0.7	0.9	1.1	0.2	0.2	0.4	0.6	0.1	0.2	0.3	0.6	0.1	0.1	0.2	0.3
BEL	0.3	0.3	0.4	0.7	0.7	0.7	0.9	1.1	0.2	0.2	0.4	0.6	0.1	0.2	0.2	0.6	0.1	0.1	0.1	0.3
CZE	0.3	0.3	0.4	0.7	0.7	0.7	0.9	1.1	0.2	0.2	0.4	0.6	0.1	0.2	0.2	0.6	0.1	0.1	0.1	0.3
DNK	0.3	0.3	0.4	0.7	0.7	0.7	0.9	1.1	0.2	0.2	0.4	0.6	0.1	0.2	0.3	0.6	0.1	0.1	0.2	0.3
FIN	0.4	0.4	0.5	0.8	0.8	0.8	1.0	1.2	0.3	0.3	0.5	0.7	0.2	0.3	0.3	0.7	0.1	0.2	0.2	0.4
GRC	0.5	0.5	0.6	0.9	0.8	0.8	1.0	1.2	0.4	0.4	0.6	0.7	0.2	0.4	0.4	0.7	0.1	0.2	0.2	0.4
HUN	0.3	0.3	0.4	0.7	0.7	0.7	0.9	1.1	0.2	0.2	0.4	0.6	0.1	0.2	0.2	0.6	0.1	0.1	0.1	0.3
ISL	0.4	0.4	0.5	0.8	0.7	0.7	0.9	1.1	0.3	0.3	0.5	0.6	0.2	0.3	0.3	0.6	0.1	0.2	0.2	0.3
IRL	0.3	0.3	0.4	0.7	0.7	0.7	0.9	1.1	0.2	0.2	0.4	0.6	0.1	0.2	0.2	0.6	0.1	0.1	0.1	0.3
KOR	0.3	0.3	0.4	0.7	0.7	0.7	0.9	1.1	0.2	0.2	0.4	0.6	0.1	0.2	0.2	0.6	0.1	0.1	0.1	0.3
LUX	0.3	0.3	0.4	0.7	0.7	0.7	0.9	1.1	0.2	0.2	0.4	0.6	0.1	0.2	0.2	0.6	0.1	0.1	0.1	0.3
MEX	0.5	0.5	0.6	0.9	0.8	0.8	1.0	1.2	0.4	0.4	0.6	0.8	0.2	0.4	0.4	0.8	0.2	0.2	0.2	0.4
NLD	0.3	0.3	0.4	0.7	0.7	0.7	0.9	1.1	0.2	0.2	0.4	0.6	0.1	0.2	0.2	0.6	0.1	0.1	0.1	0.3
NZL	0.5	0.5	0.6	0.9	0.8	0.8	1.0	1.2	0.4	0.4	0.6	0.7	0.2	0.4	0.4	0.7	0.1	0.2	0.2	0.4
NOR	0.5	0.5	0.6	0.9	0.8	0.8	1.0	1.2	0.4	0.4	0.6	0.8	0.2	0.4	0.4	0.8	0.2	0.2	0.2	0.4
POL	0.4	0.4	0.5	0.8	0.8	0.8	1.0	1.2	0.3	0.3	0.5	0.7	0.2	0.3	0.3	0.7	0.1	0.2	0.2	0.4
PRT	0.4	0.4	0.5	0.8	0.8	0.8	1.0	1.2	0.3	0.3	0.5	0.7	0.2	0.3	0.3	0.7	0.1	0.2	0.2	0.4
SVK	0.3	0.3	0.4	0.7	0.7	0.7	0.9	1.1	0.2	0.2	0.4	0.6	0.1	0.2	0.2	0.6	0.1	0.1	0.1	0.3
ESP	0.5	0.5	0.6	0.9	0.8	0.8	1.0	1.2	0.4	0.4	0.6	0.7	0.2	0.4	0.4	0.7	0.1	0.2	0.2	0.4
SWE	0.4	0.4	0.5	0.8	0.7	0.7	0.9	1.1	0.3	0.3	0.5	0.6	0.2	0.3	0.3	0.6	0.1	0.2	0.2	0.4
CHE	0.4	0.4	0.5	0.8	0.7	0.7	0.9	1.1	0.3	0.3	0.5	0.6	0.2	0.3	0.3	0.6	0.1	0.2	0.2	0.4
TUR	0.6	0.6	0.7	1.0	0.8	0.8	1.0	1.2	0.4	0.4	0.7	0.8	0.2	0.4	0.4	0.8	0.2	0.2	0.2	0.4

Source: OECD, 2009

Appendix 3 - Output gap

Country	Variable Frequency	Unit	Output gap of the total economy										
			Time	2010	2011	2012	2013	2014	2015	2016	2017		
Austria	Percentage	i		-1,964	-0,373	-0,943	-1,869	-2,526	-2,788	-2,546	-2,076		
Belgium	Percentage	i		-0,146	0,478	-0,471	-1,466	-1,305	-1,187	-1,241	-1,023		
Czech Republic	Percentage	i		-0,575	0,079	-1,922	-3,683	-3,278	-0,900	-0,387	0,371		
Denmark	Percentage	i		-2,120	-1,354	-1,887	-2,706	-2,141	-1,735	-1,495	-0,511		
Estonia	Percentage	i		-10,119	-4,907	-2,122	-2,500	-1,561	-2,154	-2,136	-0,923		
Finland	Percentage	i		-2,186	-0,059	-1,871	-2,942	-3,926	-3,736	-3,145	-2,466		
France	Percentage	i		-1,551	-0,468	-1,232	-1,571	-1,971	-1,831	-1,618	-1,347		
Germany	Percentage	i		-1,902	0,595	0,095	-0,527	0,027	0,152	0,373	0,735		
Greece	Percentage	i		0,061	-7,464	-12,605	-14,153	-12,413	-11,964	-11,778	-10,049		
Hungary	Percentage	i		-2,803	-1,743	-4,229	-3,385	-1,402	-0,284	-0,512	0,658		
Iceland	Percentage	i		-5,527	-5,202	-5,579	-2,976	-2,712	-0,806	1,297	2,373		
Ireland	Percentage	i		-7,153	-6,312	-7,806	-7,766	-4,514	0,604	2,726	3,348		
Italy	Percentage	i		-2,433	-1,529	-3,886	-5,015	-4,753	-3,712	-2,397	-0,854		
Japan	Percentage	i		-1,846	-2,564	-1,194	-0,180	-0,552	-0,319	0,062	0,180		
Netherlands	Percentage	i		-1,109	-0,367	-2,280	-3,454	-3,351	-2,457	-1,954	-1,098		
Norway	Percentage	i		-1,914	-2,006	-0,254	0,016	0,220	-0,839	-1,986	-2,020		
Poland	Percentage	i		-0,214	1,451	-0,107	-1,729	-1,484	-1,025	-1,172	-0,763		
Portugal	Percentage	i		-1,500	-3,463	-6,988	-7,659	-6,767	-5,480	-4,438	-3,192		
Slovenia	Percentage	i		-1,796	-1,706	-4,887	-6,465	-4,746	-3,298	-3,137	-2,251		
Spain	Percentage	i		-2,092	-3,733	-6,668	-8,510	-7,558	-4,971	-2,755	-1,175		
Sweden	Percentage	i		-1,588	-0,600	-2,078	-2,418	-1,931	-0,294	0,741	1,179		
Switzerland	Percentage	i		-0,551	-0,549	-1,286	-1,303	-1,171	-2,008	-2,402	-2,310		
Turkey	Percentage	i		-1,756	1,729	-1,053	-1,612	-3,128	-3,581	-4,019	-4,441		
United Kingdom	Percentage	i		-3,552	-2,632	-2,594	-1,661	-0,476	0,038	0,066	0,520		
United States	Percentage	i		-3,818	-3,845	-3,344	-3,497	-2,783	-2,048	-1,816	-1,168		
Euro area (15 countries)	Percentage	i		-1,874	-0,996	-2,413	-3,221	-2,889	-2,165	-1,476	-0,727		
OECD - Total	Percentage, 2010	i		-2,460	-2,004	-2,237	-2,506	-2,174	-1,717	-1,460	-0,953		

Source: OECD, 2016

Auteursrechtelijke overeenkomst

Ik/wij verlenen het wereldwijde auteursrecht voor de ingediende eindverhandeling:
Alternative mechanism for monetary policy: 'helicopter money'

Richting: **master in de toegepaste economische wetenschappen-accountancy en financiering**

Jaar: **2017**

in alle mogelijke mediaformaten, - bestaande en in de toekomst te ontwikkelen - , aan de Universiteit Hasselt.

Niet tegenstaand deze toekenning van het auteursrecht aan de Universiteit Hasselt behoud ik als auteur het recht om de eindverhandeling, - in zijn geheel of gedeeltelijk -, vrij te reproduceren, (her)publiceren of distribueren zonder de toelating te moeten verkrijgen van de Universiteit Hasselt.

Ik bevestig dat de eindverhandeling mijn origineel werk is, en dat ik het recht heb om de rechten te verlenen die in deze overeenkomst worden beschreven. Ik verklaar tevens dat de eindverhandeling, naar mijn weten, het auteursrecht van anderen niet overtreedt.

Ik verklaar tevens dat ik voor het materiaal in de eindverhandeling dat beschermd wordt door het auteursrecht, de nodige toelatingen heb verkregen zodat ik deze ook aan de Universiteit Hasselt kan overdragen en dat dit duidelijk in de tekst en inhoud van de eindverhandeling werd genotificeerd.

Universiteit Hasselt zal mij als auteur(s) van de eindverhandeling identificeren en zal geen wijzigingen aanbrengen aan de eindverhandeling, uitgezonderd deze toegelaten door deze overeenkomst.

Voor akkoord,

Dirkx, Benneth

Wijckmans, Jannick

Datum: **27/12/2016**