LISBON SCHOOL OF ECONOMICS & MANAGEMENT
UNIVERSIDADE DE LISBOA

MESTRADO

FINANCE

TRABALHO FINAL DE MESTRADO

DISSERTATION

THE UNAVOIDABLE LINK BETWEEN CREDIT EXPANSION AND MONEY CREATION

MARTA DE MELO DIAS MONTEIRO

OUTUBRO – 2016

LISBON
SCHOOL OF
ECONOMICS &
MANAGEMENT
UNIVERSIDADE DE LISBOA

MESTRADO EM
FINANCE

TRABALHO FINAL DE MESTRADO
DISSERTATION

THE UNAVOIDABLE LINK BETWEEN CREDIT EXPANSION AND MONEY CREATION

MARTA DE MELO DIAS MONTEIRO

ORIENTAÇÃO:

PROFESSOR MIGUEL ST. AUBYN

OUTUBRO – 2016

i. Acknowledgments

I am extremely grateful to a number of people that were involved and helped me in the elaboration of this dissertation.

To my supervisor Miguel St. Aubyn for all support and guidance during the last six months.

To my family and friends for their patience, support, confidence and encouragement.

To João for never letting me quit and for all the time spent by helping me in the research work.

ii. Abstract

The purpose of this dissertation is to clarify the link between money and credit expansion, by explaining how money is really created, and how the understanding of this link could be of great help in order to solve an economic crisis. After the Great Recession of 2007/08 many efforts were taken globally but many countries are still perturbed in their economic path. Those measures will be discussed and their results analysed. Distinguishing countries that are issuers of their own currency from the other ones, like Eurozone countries, it becomes possible to understand the best measures to be taken by each one and what the flaws in the system are. Two basic solutions are proposed in the end of this dissertation in order to help Eurozone countries that still face a recession to reach better economic results.

Keywords: money, credit, banks, central banks, households, firms, debt, recession, crisis

iii. Resumo

O propósito desta dissertação é clarificar a ligação entre criação de dinheiro e expansão de crédito, explicando como é realmente criada a moeda, e como a clara percepção desta ligação pode ajudar a encontrar soluções para a crise económica. Depois da Grande recessão de 2007/08 muitos esforços foram tomados a nível global mas muitos países ainda enfrentam preocupações relativas ao seu desenvolvimento económico. Estas medidas serão explicadas e os seus resultados analisados. Distinguindo os países que emitem a própria moeda dos outros, como os países da zona Euro, é possível perceber as melhores medidas a serem tomadas por cada um deles e quais as falhas no sistema. Duas soluções simples serão propostas no fim desta dissertação de forma a ajudar os países da zona Euro que ainda enfrentam a recessão a alcançar melhores resultados económicos.

Palavras-chave: moeda, crédito, bancos, bancos centrais, famílias, empresas, dívida, recessão, crise

Table of Contents

1. Introduction 1

2. Money creation – Debt creation 3

2.1. What is money? 3

2.2. Money creation by central banks 3

2.3. Money creation by commercial banks 4

2.4. Money = Debt 5

3. Central banks, governments, firms and households and their behaviour during the Great Recession 8

3.1. Central banks 8

3.2. Governments 10

3.3. Firms 11

3.4. Households 12

3.5. The aggregate behaviour and the deflationary path of the economy 12

3.6. The difference between issuers of currency countries and Eurozone countries 18

4. The main Eurozone's problem and its possible solutions 20

4.1. Credit guidance 26

4.2. Funding government debt through loans from commercial banks 29

5. Conclusion 32

6. Bibliography 35

1. Introduction

There is a direct link between money creation and credit expansion, an increase in the money supply corresponding directly to an increase in credit creation. Money is created both by central banks and commercial banks and all of it have a corresponding liability. A reference to money creation is a reference to credit expansion. With this in mind it is easier to explore which were the flaws in economic decisions taken to tackle the Great Recession of 2007/08 and the economic downturn that followed it.

Banks are usually considered mere intermediaries and are not taken into due account in most economic models taught at schools. However, banks have an important role in the economy as they are responsible by about 97% of the money supply. Integrating banks in the economic analysis will allow us a more accurate vision of the whole situation.

By the time that the Great Recession hit the world, governments, firms and households were very indebted. The first action taken by them was to reduce their debts, reducing the level of money supply. In the other hand, Central banks tried to reinstate confidence in the interbank market in order to guarantee the money supply, working as if there were always demand for money and for credit.

When the crisis hit the world, demand for credit decreased and monetary policy taken by central banks did not trickle down to the economy. Financial markets and interbank markets stabilized but the real economy remained in crisis. Since households and firms were not demanding credit then the money supply could not reach the real economy.

A lot of measures like deficit reduction and austerity were taken by governments but many countries, especially Eurozone countries, are still in a recession. The main reason for this is that those measures nullify the effectiveness of the monetary policy taken by central banks.

Understanding differences between countries that issue their own currency and countries that do not issue the currency that they use will allow us to understand the main problems of the Eurozone countries and their limitations to solve the economic crisis.

By exploring the flaws of the system and of the measures taken, this dissertation will purpose some solutions for Eurozone countries to react to the crisis. These solutions are directly related to credit creation and money supply, and they are a credit guidance plan and a possibility of governments to fund their sovereign debt through contractual loans from commercial banks.

2. Money Creation and Credit Expansion

2.1. What is money?

Accordingly to Mishkin (2014) money is everything which is accepted in payments of goods and services or in repayment of debts.

Money can be created by central banks and commercial banks. Central banks create reserves and physical money (cash and coins). Commercial banks create electronic money in the form of deposits (bank account money).

2.2. Money creation by central banks

Central banks create reserves by buying financial assets from commercial banks, such as treasury bills or corporate bonds. Physical money is created by swapping printed money in exchange of reserves at a fixed exchange rate of 1 to 1.

Reserves are only used by banks to interbank payments and liquidity management and they do not count as part of the economy money supply. (Ryan-Collins et al, 2012)

When central banks buy financial assets they create reserves, and when they sell those financial assets back to the market they destroy reserves. Central banks do not use existent reserves for the operation.

By raising the amount of reserves in the system, central banks reduce the interest rate[1] and vice versa. The interest rate is the price of borrowing or lending reserves in the interbanking market and is a tool of central banks to implement monetary policy.

[1] Central bank controls the interest rate by setting a target interest rate between the rate on the deposit facility and the interest rate on the main refinancing operations.

As central banks are the banks of commercial banks the latter deposits are liabilities of central banks in the form of reserves. Money in circulation is also a central bank liability.

2.3. Money Creation by Commercial Banks

Bank of England, through McLeay et al (2014), brought to discussion how money is really created in the modern economy, explaining how most money in the modern economy is created by commercial banks in the process of making loans. It refers two misconceptions about money creation. The first one is that commercial banks act as intermediaries, lending out the deposits that savers place with them. The second one is that the quantity of loans and deposits in the economy is determined by central banks through the control of the quantity of reserves in the system. McLeay et al (2014) clarified that: "*In reality, neither are reserves a binding constraint on lending, nor does the central bank fix the amount of reserves that are available.*"

As Vítor Constâncio (2016), vice president of the ECB, said at the conference on "European Banking Industry: what's next?": "*When they (banks) concede credit, banks create money by creating a corresponding deposit*."

In the same way, when a loan is repaid the deposit money is destroyed.

The Endogenous Money Creation Theory advocates that: "[it] *is the commercial banks, rather than the central bank, that determine the money supply*." (Jackson & Dyson, 2012)

Banks make loans creating deposits in the process, not the inverse. There is no need of deposits to make a loan. "*When banks make loans they create additional deposits for those that have borrowed*" (Berry et al, 2007)

And what is more, banks do not look at their reserves ratio during the process of making loans, as Werner (2014a) has shown restoring to empirical testing. Banks only need reserves when deposits move out of their balance sheet, as transfers to other banks or as withdrawals.

Banks creates money "out of thin air", as long as demand exists. "*Under a fiat money standard and liberalized financial system, there is no exogenous constraint on the supply of credit except through regulatory capital requirements. An adequately capitalized banking system can always fulfill the demand for loans if it wishes to.*" (Bank of International Settlements, 2010)

As Stephanie Kelton (2012) puts it: "*The loan officer doesn't look in the vault to find out if they can make the loan. (…) They look at your balance sheet, not their balance sheet. And if they think they can make money by extending credit to you, then they simply use the computer. They credit your bank account. You get money and they get this asset called a loan"*

McLeay et al (2014) explain that, by setting the interest rate on central bank reserves, monetary policy is influencing interest rates in the market including those in bank loans. Monetary policy can affect the creation of money by commercial banks but cannot limit it.

"[T]he central bank injects reserves into the banking system according to banks' demand in order to steer the interbank interest rate towards a level that is consistent with the intended monetary policy stance." (ECB, 2015a) The central banks will always respond to the demand of reserves from commercial banks. "*The central bank is unlikely to refuse any request for additional reserves, indeed doing so would go against*

one of the central bank's core functions - its mandate to protect financial stability." (Jackson & Dyson, 2012)

"A bank can issue credit up to a certain multiple of its own capital, which is dictated either by regulation or market discipline. Within this constraint, the growth of bank lending is determined by the demand for and willingness of banks to extend loans." (Bank of International Settlements, 2010)

By making a loan commercial banks are expanding their balance sheets while capital stays constant. Banks should assure that they are able to obtain profits from those new loans to generate capital growth.

2.4. Money = Debt

By considering how central banks create reserves and physical money we immediately conclude that both of those are liabilities in the central bank balance sheet.

Commercial banks create electronic money, better known as bank money, every time they issue a loan. This "new" bank money is a liability in the bank balance sheet.

By observing the process of money creation it is possible to conclude that all money has debt as collateral. "*Money is primarily created by the extension of credit*" (BundensBank, 2009). All money in the system has a corresponding debt. Marriner S. Eccles, former chairman of Federal Reserve, testified in 1941 that "if there were no debt in our money system (…) there wouldn't be any money". (U.S. House, 1943) With this framework of new financial economic understanding we can say that all money in the economy is a balance sheet liability of some identity on the monetary system.

The quantity of money in the economy does not depend on supply but on demand. Central banks set the price of money (interest rate) but cannot decide how much of it is created by commercial banks. Money creation is endogenous. In fact, data from England of December 2013 reports that the central bank is responsible for 3% of the money supply (physical money) in the economy while the commercial banks are responsible for 97% of the money supply (bank money). (McLeay et al, 2014)

Credit expansion corresponds to monetary expansion. When there is credit expansion (contraction) there is monetary expansion (contraction). This expansion (or contraction) starts with the demand (or lack of demand) of debt by the economic agents through the commercial banking system.

Commercial banks play a very important role in the economy as money creators, not as mere intermediaries, but they are not always taken in due consideration by some economists.

Commercial banks, because of their importance in the economy, can also be responsible of creating speculative bubbles. Since they are profit seeking institutions they worry about the quantity of credit created and quality of the credit at moment zero but they do not worry about the implications that an unproductive allocation could affect them and the economy in the future. Thus, it is possible to consider two types of credit: unproductive and productive. Unproductive credit is the one which is allocated to consumption (it could create inflation without growth) and the one which is allocated to financial transactions (it could create assets inflation and bubbles leading to banking crises). Productive credit is the one that leads to growth and that

may even raise employment. This is the case of credit to investment (e.g. equipments) with future production purposes. (Werner, 2012)

3. Central banks, governments, firms and households and their behaviour during the Great Recession

As is now part of the contemporaneous history, a financial and economic crisis set in globally in 2007/08, sparkled by the real state crash in the United States and spread all across the rest of the world. Instability of the financial system and interbank markets were the main financial problems identified after the beginning of the crisis. Those problems were leading to a credit contraction, to price stagnation and to unemployment. Raising sovereign debt ratios were also starting to become a problem in Eurozone countries.

Central banks, governments, firms and households, mostly in uncoordinated form, responded to the crisis, taking all measures they could to tackle the problems ahead.

3.1. Central Banks

Central Banks, as monopolistic monetary authorities, intervene in the economy through monetary policy.

"*Monetary policy concerns the decisions taken by central banks to influence the cost and availability of money in an economy*." (ECB, 2015b) It is put into practice by setting the interest rate target and the supply of reserves.

Some central banks have adopted monetary policy measures that were to be referred to as Quantitative Easing (QE). McLeay et al (2014) defines QE as an asset purchase programme on behalf of the central banks to create a monetary stimulus.

"*Many central banks have used outright purchases as part of their monetary policy, often referred to as quantitative easing, or QE. It has been employed by the Federal Reserve Board, the Bank of England and the Bank of Japan. Open market operations are a core instrument of central banks even in normal times. Outright purchases become useful when policy interest rates cannot be reduced any further. They can help central banks to fulfil their mandate, which in the case of the ECB is maintaining price stability, and thereby support growth and the creation of jobs.*" (ECB, 2015c)

"*QE involves a shift in the focus of monetary policy to the quantity of money: the central bank purchases a quantity of assets, financed by the creation of broad money and a corresponding increase in the amount of central bank reserves. The sellers of the assets will be left holding the newly created deposits in place of government bonds*." (McLeay et al, 2014)

Quantitative Easing has the goal of raising the quantity of reserves in the banking system to stabilize the financial system, to avoid banks stopping loaning reserves to each other with fears of being in need of them in the future and in this way to restore the trust in the interbanking payment mechanism (clearing balance flow) between financial institutions. QE aims to stabilize trust in the interbank market so that banks continue to expand their balance sheet through credit to the economy.

Central banks assume that demand for credit by economic agents will always exist. QE focused on financial markets stability in a way of keeping banks working according to normal standards.

"*The aim of the policy was to induce a rebalancing of portfolios by the private sector. In short, asset purchases should lead to an increase in the prices of government bonds and other close substitutes and a fall in their yields. In turn, the implied rise in the value of portfolios and the lower cost of external finance should lead to a boost in consumption and investment spending in the economy*." (Bridges & Thomas 2012)

3.2. Governments

Governments intervene in the economy using fiscal policy. Fiscal policy aims to stabilize the economy across the economic cycle. It is a government's responsibility and it uses the government budget, both the revenues and expenditures sides, as the main instrument.

The size of government debt became an important issue with the financial crisis. Because of the lack of growth governments tried to reduce their deficits with the belief that reaching a balanced budget would restore the economy by inducing a lower Debt/GDP ratio and so reinstating confidence in the financial markets.

Some European countries adopted several so called austerity measures to tackle the debt and the deficit. "*Austerity is a form of voluntary deflation in which the economy adjusts through the reduction of wages, prices, and public spending to restore competitiveness, which is (supposedly) best achieved by cutting the state's budget, debts, and deficits. Doing so, its advocates believe, will inspire "business confidence" since the government will neither be "crowding-out" the market for investment by*

sucking up all the available capital through the issuance of debt, nor adding to the nation's already "too big" debt." (Blyth, 2013)

3.3. Firms

The financial crisis leads to asset depreciation. Firms saw its balance sheets shrinking in the process. Their main concern was to pay the debts that had those same assets as collateral.

If assets depreciate and liabilities are not paid, firms embrace fears of insolvency because their capital shrinks in an amount equal to the asset depreciation.

A shift in the corporate behaviour paradigm emerges as "*a large portion of the private sector is actually minimizing debt instead of maximizing profits*" (Koo, 2011)

Richard C. Koo (2008), Chief Economist at Nomura Research Institute in Japan, gave the name of balance sheet recession to this new paradigm. He detected this phenomenon in the 90s Japanese crisis, and he observed the same pattern happening after the 2007/08 crisis. Koo (2008) assesses that in a balance sheet recession the firm's priorities are in reducing liabilities in the balance sheet and in paying down debt, and not in pursuing new investments while doing it.

These actions could also be justified by the installed capacity utilization diminished rate. With the lack of aggregate demand, production has a tendency to slowdown. With the decrease of sales and revenues the need of new investments does not arise because firms start working bellow their production maximum potential.

To pay their debts firms need to maintain or raise existent cash flows through spending cuts, wages cuts or even workers layoffs.

3.4. Households

Households were very indebted when the great recession hit the US. The assets price decline and the credit supply reduction led to active borrowing constrains in many households and these constrains lead to a decline in household's consumption. (Baker, 2014)

In Europe, concerns about savings for debt payments are higher in indebted households that spend more than their incomes than in households with positive savings. The precautionary factor is the most relevant motive for household's savings. Households used to save money in order to be prepared for unexpected events. (Le Blanc et al, 2015)

The financial crisis brought fears about lack of employment, rising of taxes, decline in incomes, among others. Households' expectations about the future became pessimistic all around the world.

Both because of higher levels of debt and of pessimistic perspectives of the economy the consumption behaviour of households changed.

As well as firms, households started to pay down their debts and increasing savings in order to repair their balance sheet. (Koo, 2008)

Households reduced debts, reduced consumption and raised savings. This added to a further decline in the aggregated demand for credit.

3.5. The aggregate behaviour and the deflationary path of the economy

According to the analysis in the first section of this dissertation we now know that there is a direct link between credit expansion and money creation. When we mention credit expansion we are directly referring to money expansion.

In a recession the economy shrinks, and therefore there is a contraction in credit which is a decrease in the amount of money. It is necessary to recover this amount of money to restart the economic transactions engine, the buying and selling of goods and services that the economy has the potential to consume and produce, in order to reduce unemployment and to keep inflation at its target.

All sectors of the economy on their own used their tools to properly deal with the crisis. The question of the effectiveness of such measures arises when they are analysed as a whole. What happens when heir solutions are applied simultaneously will be analysed in the following paragraphs.

Usually taught economic models assume that commercial banks are mere intermediaries in the economy. It is argued that banks collect savings from savers to be able to lend. As shown in the first chapter of this work, commercial banks have a very important role in the economy because with their power to create money "out of thin air" they turn out to be one of the great drivers of the economy.

None of the mainstream economic models takes private debt into due account. It assumes that debt is a redistribution of savings (money already in the system). These models do not consider that the expansion of private debt expands the quantity of money in circulation and by doing so it raises the purchasing power of the individuals raising aggregate demand and investment.

The assumed behaviour by central banks, governments, firms and households make sense from an individualistic point of view. Each one takes the necessary measures they find the most appropriate to tackle the crisis.

With the 2007/08 financial crisis banks went bankrupt and the financial sector has become crippled. The great recession spread itself into the whole world and deeply affected the real economy. Deflation and unemployment were the big problems in the minds of the governments and central banks while the economy was shrinking.

After the burst of the subprime bubble, banks saw their assets impaired. A big part of loans got into trouble and became known to the banks as Non-Performing Loans (NPL). The bank capital was diminished and some well-known banks went bankrupt. The interbank market became instable and the trust to loan reserves between banks was fragile. So, when banks saw their capital ratios at risk they close the flow of liquidity through credit into the system.

Central banks decided to tackle the lack of liquidity in the system. They started a programme of Quantitative Easing. With this programme they injected reserves in the interbank market by purchasing assets from commercial banks, insurance companies, pension funds, etc. By raising the quantity of reserves in the system, banks started to trust each other and were able again to loan reserves between them as before and if necessary. Knowing now that banks only need reserves when deposits from clients are asked to be transferred out of their balance sheet (to the balance sheet of other bank or through withdrawals of currency, physical cash by the client) and that when they extend credit an equivalent deposit is created, and given the insurance that reserves will not be lacking in the interbanking market if necessary, banks can now expand their balance sheet trough credit because trust was restored.

With the purchasing of assets from central banks the yields of those assets were lowered and the value of the bank portfolios rose.

If the lack of credit was a supply problem only the monetary policy decisions would be sufficient to work out the solutions necessary to target growth and inflation at 2%. But this crisis affected all economic sectors and the problem was not just one of supply but also one of demand.

Households and firms were the credit takers in older times. They change their behaviour and today they have a new priority of minimizing debt.

Households worried about the economic future see the necessity to further raise their savings, in this way creating a security buffer. In these circumstances, there is a bigger worry with a possibility of unemployment and taxes being raised. The priority of households was in liquidating their debt and they have no incentive to create further demand for new debt (money is destroyed by the process of paying loan debts). The bottom line is, when households simultaneously reduce spending they are reducing aggregate demand.

Firms see their sales diminished with the fall of aggregate demand provoked by households reducing debt. Their profits are squeezed in the process. With less production there is no necessity or incentive to maintain the same number of employees so unemployment becomes a reality. Firms can also lower wages and in doing so they lower household's income. If aggregate demand is insipient there is no further necessity of new investments or to go further into debt and the priority changes from maximizing profits to minimizing debt.

An aggregate problem in the economy arises when most of the firms start behaving in the same way creating a direct contribution to the deflation of the economy. Unemployment rises and decreases households' income to spend, thus enhance the reduction in demand. With this process households and firms see their income reduced and the capability of servicing the existing debt is reduced in the same amount. With less income or cash-flows to service debt, loans go into default imposing losses on banks and solvency problems start to appear in the bank's balance sheet by the raising of non-performing loans in the financial sector.

When firms stop borrowing money to expand their business and begin paying down debt the economy shrinks because firms stop investing cash flows and stop borrowing and spending the savings back into the economy. The resulting leakage of aggregate demand turns the affected countries' economies into severe recessions. (Koo, 2008)

At the same time firms and households are reducing their debts, governments are pursuing the same path because of the pressure felt in the sovereign government debt. There is a worry to get to balanced budgets, to reduce deficits and to "put the house in order", thus reducing expenditures and raising revenues.

A main concern is about the size of government debt in relation to Gross Domestic Product (Debt to GDP ratio). Governments start to tackle debt because of worries about government's default in sovereign debt, based on the belief that a bigger Debt to GDP ratio raises the probability of government default. However some problems may arise from these decisions. With lower aggregate demand Gross Domestic Product (GDP) is also reduced. The expedient of debt reduction to upgrade

the Debt to GDP ratio could simply do not work if, in percentage terms, GDP is reduced more than the public debt.

The lack of money in the economy comes from the lower demand for credit. While existing debt is being paid money is being destroyed. To raise the quantity of money back into the economy it is necessary to expand debt. Central banks, knowing this, intervene in a way that creates the conditions (liquidity and trust) in commercial banks to maintain the supply of credit.

By reducing debt, households, firms and governments are not contributing as a whole to the economic expansion. A country in this situation is dependent on exports (deficit/debt of the rest of the world) to get the funds needed to stabilize the economy.

Some countries, mainly Eurozone countries, adopt austerity measures to raise competitiveness in order to attract external demand. If external demand does not offset the volume of imports (deficit in the current account) the results of the austerity policy are not positive.

In this manner, households, firms and governments together, contribute to a bigger contraction to the economy. The economy is deleveraging and enters in a deflationary spiral.

Households with their reduced incomes reduce consumption. With the deflationary path of the economy they can reach a point where they have to choose between payment of debts or basic consumption. Loans that were healthy can become a NPL.

With the aggregate demand reduction firms have lower sales and consequently their economic results are smaller. With the raising of taxes those results diminish even further. Unemployment rises, wages are reduced and insolvencies can occur. Firms can go into default spreading exponentially the NPL to banks.

A new round of Non-Performing Loans gets stuck in the banks' balance sheets. The banks' capital suffers further losses and the trust that the central banks restored with the first Quantitative Easing Programme is destroyed. Banks turn apprehensive about expanding the balance sheet through credit creation.

A new central bank intervention or even a government interference becomes a necessity in the form of so called bailouts to provide liquidity lines, asset loans, and trust to help restore capital ratios reduced by the new NPL.

If households, firms and governments keep going with the same contractionary behaviour, the expansionary policy of the QE Programme is not going to be able to tackle the real economy and this cycle of deflationary pressures will repeat over and over again, enhancing the deflation spiral even further.

3.6. The difference between Issuers of Currency Countries and Eurozone Countries.

As Alan Greenspan (2011), Former Chairman of the Federal Reserve stated: "*The United States can pay any debt it has because we can always print money to do that. So there is zero probability of default.*"

The big difference between a country that issues currency and a country that uses a foreign currency is related to sovereign debt default. A country that issues its own currency can never go into default related to sovereign debt denominated in its

own currency. A country that lost its sovereign currency and that depends on the currency supply from a foreign central bank can go into default even if debt was issued in the very same currency in circulation in the country. However is important to clarify that all countries can go into default in international debt when this is issued in a foreign currency that they do not issue.

"*The fundamental difference between a household, a business, a state or a local government and the U.S. federal government is that the U.S. federal government is the issuer of the currency, and everybody else that I mentioned is merely the user of the currency. We all have to go out and get the dollar in order to spend the dollar. We either have to earn it, we have to borrow it, we make investments, we may have interest income – whatever, but we have to come up with the currency from some source.*" (Kelton, 2012)

Ruml (1946), former Federal Reserve's chairman, explains that "The necessity for a government to tax in order to maintain both its independence and its solvency is true for state and local governments, but it is not true for a national government." Eurozone countries as users of foreign currency are in this respect better compared to a state or local government in the US than to the federal government.

The questions that arise when a country that issues its own currency monetizes its debts are related to inflation, currency devaluation or market competitiveness, but never to a lack of funds. However, nothing insures that the quantity paid at maturity has the same purchasing power that it had before.

Likewise we can defend that a country that issues its own currency has no funding limits to their own deficit or is revenue constraint.

The 19 Eurozone countries need to collect funds from the economy to pay for their expenditures. The growth and stability pact adopted in 1997 refers that deficit limits of the member states are of 3% of GDP. This pact is written on the grounds that there is a positive probability of a sovereign debt default.

4. The main Eurozone's problem and its possible solutions

Two of the main Eurozone's problems are the fact that countries have to deal with the deficit limits and do not have the control of their own currency. This restricts the flexibility of the fiscal policy to accommodate the monetary policy.

Through the analysis made in the last section we can conclude that in the current recession an expansionary fiscal policy that complements the monetary policy becomes necessary.

Every time a recession or depression emerges, fiscal policy and monetary policy should work side by side. If they are not working in the same mind set, an economy in recession can go into an economic depression.

In normal times the amount of credit supply is higher that the loans that are been liquidating. When the situation reverses itself and the quantity of credit created is lower than the credit liquidated, the quantity of money in the economy diminishes and consequently there is less purchasing power. This process of deleveraging is reinforced when most of previously credit creation was used as unproductive credit that created speculative bubbles.

Monetary policy intervention solves the problem of the money supply through interest rates reduction and credit easing by the asset purchase programme (QE).

Fiscal policy has as the main goal the stability of the economy, and governments should act as debtor of last resort for the necessary credit in the economy when the private sector is not incentivised to respond to lower interest rates.

The government should cooperate with monetary policy creating a demand for credit necessary to the economy efficiency and to offset the constraints (lack of credit demand) in the private sector. In this way the government would reverse the credit contraction created by the private sector, not depriving them of purchasing power and give it some slack that will make it able to liquidate its own debt without the economy shrinking further.

However, governments raise debt through bills and bonds emission and none of these above implies money or credit creation. Instead there is a redistribution of purchasing power. Without credit creation it is not possible to offset the behaviour that firms and households are pursuing. However, when governments issue bonds raising debt and consequently the deficit, the private sector purchasing power is also raised. There is some income redistribution where the savings instead of idle in deposits go into circulation chasing goods and services by the operation of government expenditures. This process gives the private sector time and money to liquidate their liabilities and clean to up the balance sheet without seeing their incomes cut. Afterwards the normal behaviour of credit demand can restart. In this way, the government would be indirectly influencing the credit contraction process.

When the government cannot raise the level of debt, the expansionary policy of the central bank is neutralized by the fiscal contraction. Governments are not guaranteeing the efficiency of the economy as they should be doing.

There is historical evidence that a budgetary surplus or a balanced budget is not helpful in order to avoid a crisis: "*A budgetary surplus did not prevent the downturn in 1929; a balanced budget in 1930 did not prevent an acceleration of the decline.*" (Eccles, 1936)

Eccles (1936) also advocates that a government intervention raising the deficit during recessions will increase income and production and consequently tax revenues will go up gradually closing the gap between expenditures and revenues. By increasing deficit during recessions it is easier to reach a balanced budget when the economy recovers from the crisis.

In order to full understand this way of thinking we will explore the advantages and disadvantages of deficits and surpluses in times of expansion and in times of recession.

In an expansion, when there is GDP growth, unemployment is low and inflation is at normal levels the surplus tends to increase. It could be used to control aggregate demand in the way that inflation in not pushed up and can collect funds from the economy without affecting the behaviour of consumers and producers.

In a recession, when aggregate demand is low, unemployment is high and deflation is a constant worry, trying to get a surplus will result in a further contraction of the economy. By diminishing even more the purchasing power of individuals the aggregate demand level will be lowered and the recession worsens.

In an expansion, a higher deficit increases the aggregate demand and contributes to price level pressures and this could lead to an undesired level of inflation.

In a recession, a higher deficit counteracts the lower rate of consumption that was generated by the recession and supports the purchasing power of individuals. It permits that the private sector can liquidate their debts and maintain minimal levels of consumption without going bankrupt. By avoiding bankruptcies the Government can support GDP and help in a further GDP growth.

"*It should not require any great insight to understand that a reduction of government expenditures while everybody else as a matter of self-protection was being forced to reduce expenditures, could only accentuate the processes of deflation by reducing buying power. An increase in tax rates at such a time would have had a deflationary effect to the extent that they reduced expenditures that otherwise would be made, and would consequently have yielded little, if any, additional revenue*." (Eccles, 1936)

"*Higher deficits today, when unemployment is high, will cause unemployment to go down to the point we need to raise taxes to cool down a booming economy.*" (Mosler, 2010)

A surplus, or the path to it, should be put in practice when the economy is in expansion. In the other hand, the deficit, or the path to it, should be put in practice when the economy is in recession. When the economy is in expansion, it is possible to collect more from it without changing the economic agents behaviour; when the economy is in recession, it is not possible to collect the same amount even with further taxes because the economy simply does not produce those funds.

Since austerity is a set of measures leading to deficit reduction in a recession, it is easy to understand that austerity effects have a positive probability of backfiring.

Austerity only works if the country that is implementing it can increase or attract sufficient foreign funds (exports) to compensate internal expenditures. This measure is limited in a way that lets the country recovery in the hands of the foreign sector. The recovery will not depend on measures taken and decided internally but on the reaction of the rest of the world to those decisions or measures.

Problems should be solved internally and for that the deficit limits imposed by the Growth and Stability Pact should be adjusted in exceptional situations.

Government should control the total rate of spending in a way that total spending (both by private and public sectors) should be equal to the total amount of goods that is possible to produce by the economy at current prices. Government should spend more by raising its expenses when the total spending is too low, and should tax more raising its revenues when total spending is too high, maintaining an adequate aggregate demand level for current output. By doing so, government can better control the inflation and unemployment. The goal of government budget management should be to take money from individuals if their purchasing power is too high. In the same way, expenditures of the government should be aligned with the private rate of spending. (Lerner, 1943)

However, Eurozone Countries need to tax or borrow in order to pay for their expenses. Since they do not own the currency that they use and have restrictions about the deficit limits, Eurozone Countries cannot apply a functional finance plan with efficiency.

The European Union instead of instructing countries in crisis to practice austerity measures letting them dependent to the rest of the world reactions, should

open an exception to the deficit limits so that the countries can work out their problems internally. In this way, European Union in order to control the implementation of these measures would have the power to control, approve or veto the government budgets of the countries that directly benefit from the exception of increasing deficit limits. The excess deficit should be canalized to transactions that count directly to GDP growth and that contributes to the development of the economy and to a lower unemployment rate.

The other problem of the Eurozone countries is the fact that they do not have the control of their own currency in this way these countries can became insolvent and default on their obligations. This situation attracts lower credit ratings in times of recession that will drive investment out and force the interest rate on debt to increase. In a way to work out this situation, Europe should walk to a further integration.

A banking union that is being created is a tentative solution to part of the problem, by reducing from the national budgets the bailouts for national banks. These will become a responsibility of the ECB and the European Resolution Fund. The banking union will help European countries after a bank insolvency, and in this way the national budget will not be responsible for the bailout funds.

In a way that almost all European countries accept further integration, and do not quit the union like United Kingdom did in June 2016, is necessary considering the "common interest". It was with the common interest in mind that one of the United States Founding Fathers Alexander Hamilton helped unite the states of America. Hamilton promised to mutualize the states debt under a federal budget and created a

national central bank, the mint and a securities market, in this manner leading the way to a federal United States of America (Wheatley, 2012).

It is necessary to convince the countries that are not in a recession anymore that a further integration will not only benefit the countries in crisis but also the others. As long as this is not possible there are other solutions that could serve to help countries that are not out of the crisis yet.

There are many solutions that have been proposed and discussed by several economists in recent times but we focus just in two of them that are directly connected to the banking sector and money creation – Credit Guidance and Funding Government Debt through contractual loans from Commercial Banks.

4.1. Credit Guidance

The Credit Guidance framework is not a new idea. It has been put into practice in several countries[2] and its main tool is the guidance of the allocation of credit created by commercial banks.

As explained in section 2.4. there are two types of credit – productive and unproductive credit. Unproductive credit should be avoided during bust cycles in order to prevent a further downturn of the recession.

The more credit is created by banks the more money there is in the economy. However, when credit is supplied to financial transactions the money which is created does not flow directly to the real economy. Its use is unproductive and creates bubbles. It was the case of the subprime bubble in 2007/08.

[2] German before 1945, France, Austria, Italy, Spain, Sweden, India, Malaysia, Thailand, Singapore, Greece after 1945, China, Japan, Korea, Taiwan. (Werner, 2012, 2014b)

To avoid speculative bubbles, commercial banks should be incentivised to create loans to the real economy, in other words, productive credit to productive purposes that directly contribute for GDP growth. The slice of the speculative credit and consumption should be in a minor proportion than productive credit in the Banks's balance sheet.

The government should establish a credit guidance programme where it would create rules concerning credit creation and it respective allocation, promoting economic growth. This programme should be temporary and would be implemented in times of zero economic growth and/or recession.

Governments should impose ratios regarding the proportion of unproductive credit created in relation to the productive credit creation. For example for each 100€ created for unproductive purposes 200€ should be created for productive purposes. Other methods could be a fiscal benefit to the banks that allocate productive credit to the economy. In this way the government has more control over the allocation of credit.

"[N]ominal GDP growth is a stable function of credit creation for transactions that contribute to GDP." (Werner, 2014b)

The opponents of this measure would defend that the credit allocation should not be controlled because the free market is more efficient and presents better results. This would be true if we lived in a world of perfect information. However, when banks allocate credit to the speculative market they are directly contributing to a speculative bubble that sooner, rather than later, is going to damage them. When a speculative bubble bursts Non-Performance Loans pop up that will affect the capital

ratios of the banks and could lead them to the brink of insolvency. Banks, by controlling in an efficient way the quantity of credit that is put up towards the speculative market and to the real economy could avoid the creation of those NPL's and in this way protecting their own balance sheet and avoiding a possible crisis from happening.

Due to its strong role in the economy, commercial banks, if they want, could be part of the solution to the crisis. Banks can reduce liquidity for non-productive credit or they could put in practice the ratio system, explained above, so that for each amount of unproductive credit created there should be a multiple of productive one and in this way they would directly contribute to GDP growth. By doing this they could avoid NPL's that would affect them in the future.

"*Financial credit creation (…) simply produces asset inflation and subsequent banking crises*." (Ryan-Collins et al, 2012)

A good credit allocation will never be a prerogative of commercial banks because they would be diminishing the quantity of credit issued and consequently lowering their profits. Banks are profit seeking institutions – they do not work with a goal of global economic awareness. They do not internalise that by creating much more credit that is non-productive in relation to the one that is productive they are contributing to a bubble that will crash in the future. Commercial banks, every time they give a loan they evaluate if the operation is profitable and they do not look into the implications of those loans to the real economy. A new government rule of credit guidance forces banks to accomplish a better and wealthier credit allocation.

"*By severely limiting or entirely banning bank credit for transactions that do not contribute to GDP, asset bubbles and banking crises could be avoided in future.*" (Ryan-Collins et al, 2012)

4.2. Funding Government Debt through contractual loans from Commercial Banks.

In this section we are going to present a solution for fiscal policy to be more at par with an ECB expansionary monetary policy. For this to happen governments should be able to finance their debt through a contractual loan agreement with their commercial banks, instead of a new issuing of bills and bonds. In this way the government can directly avoid a credit contraction and consequently the monetary contraction caused by firms and households. As has been explained previously banks create money through the process of credit creation, increasing the money supply and accordingly provide purchasing power.

Every time government finances itself by the issuing of bonds and bills it is redistributing purchasing power that already exists in the private sector, and this could lead to the crowding out of private investment. Redistributing the purchasing power in the private sector the government incentivises consumption. The marginal propensity to consume is usually higher for lower incomes than for higher incomes. In this way, savings that one sector uses to buy the bills and bonds are redistributed to other sector with a higher probability of being used in spending. Although this financial model of public debt can have a positive effect on the economy, it is not completely efficient during a recession. The debt financial model proposed here aims to fill a flaw that the aforementioned measure cannot tackle.

Treasury bonds are rated by rating agencies and banks that buy those bonds need to put aside capital as a percentage of the bond value. If the bond's ratings change with a downgrade while the bonds are still in the bank's balance sheet they have to recognize capital provisions[3] even though they do not intend to get rid of those bonds before maturity. Bank capital and consequently the capital ratio will decrease. Due to this, banks need to be careful with the amount of bonds they purchase and demand a sufficient high interest rate to protect themselves of any future capital losses. When a country is in recession the debt rating may decrease and the governments need to finance with higher interest rates.

"*Bank loan contracts are not tradable and do not have to be marked to market.*" (Werner, 2014b)

By choosing to finance the sovereign debt through contractual loan agreements with the commercial banks there is no purchasing power redistribution. Instead, there is money creation and with this credit expansion. It is the responsibility of the government to drive this money to economic activities that are part of GDP and in this way promoting economic growth.

Government is the safest client that banks can have so the interest rate charged may be lower than the interest rate demanded by the bond issuance, since the debt will not be tradable or marked to market. The commercial bank can ask for a price very similar to the one that he receives on deposited reserves at the ECB. This

[3] Basel III on Enhancing risk coverage (Bank of International Settlements, 2011): "*Banks will be subject to a capital charge for potential mark-to-market losses (ie credit valuation adjustment – CVA – risk) associated with a deterioration in the credit worthiness of a counterparty*."

benefits a government that will finance itself at a lower interest but will also benefit banks that will increase their profits.

Once government has to increase sovereign debt, it should do it in the most efficient way and contribute directly to the economic well-being. In times when the private sector is contributing to money destruction by liquidating loans, the government should finance its debt in a way to balance the situation, i.e. creating new credit.

Through this method of debt financing, government will be using money that did not previously exist in the economy and private investment may continue with its normal behaviour, without being crowded out by public debt. The government should not use this type of debt to pay off older debts because that situation would be an unproductive credit allocation. The government should instead increase spending through productive credit allocation increasing the economy income.

The main goal of this measure is that, without the need to exceed deficit limits, the government can finance its own debt by bank contractual loans stabilizing the credit creation cycle. When the private debt is being paid off, the public debt by the form of contractual loans should increase and when the private debt increases the public debt in the form of contractual loans should be paid off, debt created being higher than debt liquidated.

Financing public debt through bank loans agreements aligned together with credit guidance would be a functional and efficient method of debt management that could further enhance GDP growth.

5. Conclusion

Money supply is created both by central banks and commercial banks, commercial banks being responsible for 97% of the money supply in the form of bank deposits. By conceding loans, banks create bank deposits and there are no limits imposed on banks about the quantity of money they can create.

Credit created by commercial banks can be allocated both to productive purposes (that account directly to GDP) or unproductive purposes (that create speculative bubbles). Therefore, commercial banks have strong influence in the path of the economy.

During the great recession in 2007/08 and after, central banks, governments, firms and households took actions on their own to tackle the crisis.

Central banks, through monetary policy, create an asset purchase programme, better known as Quantitative Easing, to reinstate the confidence in the interbank market and to guarantee that a lack of reserves would no longer be a problem.

Governments, worried about the size of their sovereign debt, started to reduce their debts and deficits. Some Eurozone countries adopted austerity measures with that purpose.

Firms observed their assets depreciate and since their capital shrinks in an amount equal to the asset depreciation, they faced insolvency fears. Firms' behaviour changed from maximizing profits to minimizing debt.

Households, that at the time the crisis hit the economy where highly indebted, started to focus on saving for debt payments. Due to the pessimistic perspective about

the future, regarding lack of employment and increasing taxes, households reduced debt, reduced consumption and raised savings.

Knowing that there is a direct relationship between money creation and credit expansion, by paying debts, governments, firms and households are directly contributing to the reduction of money supply. Their actions, when taken at the same time, shrink the economy since they reduce aggregate demand, firms' profits, they generate unemployment and they could lead to the onset of non-performing loans. That continued behaviour leads to a deflationary spiral. The central bank's monetary policy is expansionary but the governments' fiscal policy is contractionary.

In order to invert the deflationary spiral, fiscal policy should proceed along with monetary policy, raising debt and deficits to indirectly compensate the contraction of credit that is installed in the economy.

There are differences between countries that issue and the ones that do not issue their currency, as it is the case of the Eurozone countries. Eurozone countries, unlike countries that issue their own currency, can default in sovereign debt issued in the currency they have in circulation. Accordingly to that, Eurozone countries have to respect the deficit limits imposed by the growth and stability pact.

By having to obey to deficit limits and by not having the power to issue their own currency Eurozone countries cannot raise debt and deficit in the necessary amount to counteract the economy recessionary path. Eurozone flaws could be solved by further integration through the creation of a European fiscal budget or even of a federal union like USA.

However, due to the urgent necessity for some Eurozone countries to get rid of the recession in a shorter term there are some measures that could be taken internally and not at the European level.

The two measures purposed in this dissertation are the creation of credit guidance and the possibility for governments to fund their debt through loans from commercial banks.

Credit guidance would be implemented by governments in order to control the quantity and the allocation of the new credit created, incentivising credit creation allocated to productive purposes rather than unproductive purposes, imposing ratios or giving fiscal benefits to the banks. By doing so, governments are incentivising GDP growth and avoiding further speculative bubbles.

Funding government debts through loans from commercial banks would directly contribute to counter the credit contraction by firms and households. Since governments have to raise their debt, then their action could be a direct benefit for the economy, by increasing the money supply and not crowding out private investments.

Sovereign debt in the form of contractual loans from banks used accordingly with credit guidance rules would lead to an economic recovery in a better way than austerity or reducing deficit measures.

6. Bibliography

Baker, S. (2014) Debt and the Consumption Response to Household Income Shocks. Economics Department Standford University. Available at: http://web.stanford.edu/~srbaker/Papers/Baker_DebtConsumption.pdf

Bank of International Settlements (2010) The bank lending channel revisited, BIS Working Papers No 297. Available at: http://www.bis.org/publ/work297.pdf

Bank of International Settlements (2011) Basel Committee on Banking Supervision, Basel III: A global regulatory framework for more resilient banks and banking systems. Available at: http://www.bis.org/publ/bcbs189.pdf

Berry, S., Harrinson, R., Thomas, R. & Weymarn, L. (2007) Interpreting movements in broad money, Bank of England, Quarterly Bulletin, Q3. Available at: http://www.bankofengland.co.uk/publications/Documents/quarterlybulletin/qb070302.pdf

Blyth, M. (2013) Austerity: the history of a dangerous idea, 1st Ed. New York: Oxford University Press

Bridges, J. & Thomas, R. (2012) The impact of QE on the UK economy — some supportive monetarist arithmetic, Bank of England, Working Paper No. 442. Available at: http://www.bankofengland.co.uk/research/Documents/workingpapers/2012/wp442.pdf

Bundesbank (2009) - Geld und Geldpolitik, as cited and translated by Richard A. Werner (2012) The Quantity Theory of Credit and Some of its Applications, Lecture

Slides, University of Southampton. Available at: https://www.postkeynesian.net/downloads/Werner/RW301012PPT.pdf

Constâncio, V. (2016) Challenges for the European banking industry. Available at: https://www.ecb.europa.eu/press/key/date/2016/html/sp160707_1.en.html

ECB (2015a) The role of the central bank balance sheet in monetary policy, Economic Bulletin Issue 4/2015. Available at: https://www.ecb.europa.eu/pub/pdf/other/art01_eb201504.en.pdf

ECB (2015b) What is monetary policy?, European Central Bank Explainers. Available at: https://www.ecb.europa.eu/explainers/tell-me/html/what-is-monetary-policy.en.html

ECB (2015c) What is the expanded asset purchase programme?, European Central Bank Explainers. Available at: https://www.ecb.europa.eu/explainers/tell-me-more/html/asset-purchase.en.html

Eccles, M. (1936) Board of Governors of the Federal Reserve: Address of Chairman Marriner S. Eccles at the conference on Debt, Taxation and Inflation. Available at: https://fraser.stlouisfed.org/docs/historical/eccles/Eccles_19360508.pdf

Greenspan, A. (2011) Interview on Meet the Press – Transcript available at: http://www.nbcnews.com/id/44050464/ns/meet_the_press-transcripts/t/meet-press-transcript-august/#.V_gN7OArLIU

Jackson, A. & Dyson, B. (2012) Modernising Money, 1st Ed. London: Positive Money

Kelton, S. (2012) Harry Shearer interviews Stephanie Kelton. Transcript available at: http://harryshearer.com/transcript-stephanie-kelton-interview/

Koo, R. C. (2008) - The Holy Grail of Macroeconomics: Lessons from Japan's Great Recession, 1st Ed. Singapore: John Wiley & Sons (Asia) Pte. Ltd.

Koo, R. C. (2011) The world in balance sheet recession: causes, cure, and politics. Real-world economics review, issue no.58 Available at: http://www.paecon.net/PAEReview/issue58/Koo58.pdf

Le Blanc, J., Porpiglia, A., Teppa, F., Zhu, J. & Ziegelmeyer, M. (2015) Household saving behaviour and credit constraints in the euro area, European Central Bank, Working Papers Series . Available at: https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp1790.en.pdf

Lerner, A. (1943) Functional Finance and the Federal Debt. Social Research, 10(1/4), February: 38-51

McLeay, M., Radia, A & Thomas, R. (2014) – Money creation in the modern economy, Bank of England, Quarterly Bulletin, Q1. Available at: http://www.monetary.org/wp-content/uploads/2016/03/money-creation-in-the-modern-economy.pdf

Mishkin, F. S. (2004) The economics of Money, Banking and Financial Markets, 7th Ed. United States of America: Pearson

Mosler, W. (2010) - Seven Deadly Innocent Frauds of Economic Policy, 1stEd. USA: Valance, co., inc.

Ruml, B. (1946) Taxes for Revenue are Obsolete. American Affairs: A Quarterly Journal of Free Opinion, Winter Number Vol. VIII, No.1

Ryan-Collins, J., Greenham, T., Werner, R. & Jackson, A. (2012) Where does money come from?, 2nd Edition. Great Britain: New Economics Foundation

U.S. House (1943) Federal Reserve Act Amendment – Hearings before the Committee on Banking and Currency, House of Representatives, 78th Congress, 1st Session

Werner, R. (2012) The Quantity Theory of Credit and Some of its Applications, Lecture Slides, University of Southampton. Available at: https://www.postkeynesian.net/downloads/Werner/RW301012PPT.pdf

Werner, R. (2014a) Can banks individually create money out of nothing? — The theories and the empirical evidence. International Review of Financial Analysis 36 1–19

Werner, R. (2014b) Enhanced Debt Management: Solving the Eurozone crisis by linking debt management with fiscal and monetary policy. Journal of International Money and Finance 49 (2014) 443e469

Wheatley, A. (2012) Analysis: What Europe can learn from Alexander Hamilton. Reuters, available at: http://www.reuters.com/article/us-eurozone-hamilton-idUSTRE80G1PU20120117