ISCTE Business School
Instituto Universitário de Lisboa

Understanding money and its use.

The functional and structural reasons behind the use of money.

Pedro Henrique Pinto Azevedo

Project submitted as partial requirement for the conferral of

Master in International Management

Supervisor:

Assistant Professor Maria do Rosário Veiga

ISCTE-IUL, Business School

Accounting Department

October, 2015

Abstract

The objective of the current essay is to understand the functional and structural reasons behind people's use of money.

Within this perspective, it explores the origins of money, the evolution of its concept and functionalities since early civilizations, its role within society, and lastly how is it created and controlled and the consequences of the current monetary system to the modern society.

This research explains how people use money not only as a consequence of the historical functionalities that it has been fulfilling, but also as consequence of the current structure of the financial and monetary system that generates a dependency and addiction of the modern economy and its populations on this resource.

A collateral conclusion of the current essay is the privileged position that commercial banks face in the modern economic system, that not only benefit from a constant transfer of wealth and accumulation of purchasing power from the rest of the economy to the banking sector, but also gives commercial banks a tremendous power to influence and shape most economy.

The understanding of the concepts and research explored within the current essay, is fundamental to comprehend and properly lead with the root causes of some of the biggest problems of modern civilizations.

Key words: Money Creation; Monetary System; Commercial Bank, Money functions.
JEL Classification: E51, E58

Resumo

O objetivo do presente ensaio é compreender as razões funcionais e estruturais que explicam a necessidade do uso do dinheiro.

Dentro desta perspetiva, o presente texto explora as razões por de trás das origens deste objeto, a evolução do seu conceito e funcionalidades ao longo da história, bem como o seu processo de criação, controlo e as eventuais consequências do presente sistema monetário na sociedade moderna.

Esta pesquisa explica que a população não só usa dinheiro devido às funcionalidades históricas que este têm vindo a desempenhar, mas também como uma consequência do atual método através do qual este utensilio é criado, que é responsável pela dependência das economias modernas e sua população ao papel desempenhado por este.

Um resultado colateral do presente ensaio é a evidência duma posição privilegiada desempenhada pelos bancos comercias, que não só beneficiam duma constante transferência de riqueza e acumulação de poder de compra do resto da economia para o sector bancário, mas que também detêm um enorme poder para influenciar o funcionamento e estrutura da restante economia.

A compreensão de alguns destes e outros conceitos explorados na presente tese é fundamental para uma abordagem mais eficaz à eliminação das causas de alguns dos maiores problemas da sociedade moderna.

Palavras-chave: Criação de Dinheiro; Sistema Monetário; Banco Comercial, Funções Monetárias
Classificação JEL: E51, E58

Acknowledgement

First of all, if I would properly try to honor all of those who have helped and inspired me through my life by putting my gratitude into words, a single page would not be enough. They deserve their own Master thesis, simply focused on developing a fair approach of how to thank them. In this way, I will try to keep this section as short and simple as I can.

I wish to take this opportunity to express my immense gratitude for the remarkable support and immense patience of my supervisor, Professor Maria do Rosário Veiga, who spent a vast number of hours trying to improve the quality of my work. I would also wish to thank the precious guidance and advice from Professor Sofia Vale, who, among other things, helped me finding a final structure for this essay and gave me the validation that I needed to close it.

I want to specially show my appreciation to Professor José Maria Duarte, who has been, since my first week of university, a source of continuous help and a true example of someone who really loves what he does, by truly bringing passion to his teachings. For all of that, thank you.

I also would like to thank all my classmates with who I have spent the last few years, for all the sleepless nights we were working together before deadlines, and for all the fun and laughs we shared.

I would like to end by acknowledging some people that I honestly lack the words to describe my gratitude. My family, my outstanding mother and father, my amazing uncle Fernando (Tio Jorge), my grandparents, my brother, my sister, my uncle and aunt José Manuel and Teresa and my cousins. Ariana, who motivated and helped me through all this process, and all my great friends.

I know that I am not always so easy to lead with, so I would like to seize this opportunity, to say these words which come as sincere as they could ever be:

Thank you, it is an honor to have you in my life.

Table of contents

Index of figures

List of abbreviations

ABS – Asset Backed Securities

CDO – Collateralized Debt Obligation

Fed – United States Federal Reserve

BCBS – Basel Committee on Banking Supervision

BIS – Bank of International Settlements

ECB – European Central Bank

IMF – International Monetary Fund

MBS – Mortgage Backed Securities

OECD – Organization for Economic Co-operation and Development

OMOs – Open Market Operations

QE – Quantitative Easing

Repos – Repurchase Agreements

SDR – Special Drawing Rights

SPV – Special Purpose Vehicle

UK – United Kingdom

UN – United Nations

US/USA – United States of America

Introduction

The cornerstone of any monetary system, as the proper name suggests, is money itself. With the enormous complexity of the modern economy it becomes tremendously difficult to imagine a system without it, yet until very recently most of the neo-classic orthodox economic theory, rooted on the "Smithian's veil over barter" concept (Smith, 1776), sees money simply as a token that serves to oil the wheels of trade, neglecting the true influence of money in national and global events, even after several financial crisis in the last century.

In contrast, for some, money is the root of all evil, the manifestation of greed, for others, a symbol of social status and an icon of power which turns living man into Gods, and Gods into profits, as revenues become reasons to kill and die for. Does not quite matter how is it defined, as when analyzing the realm of men few are those who can live without it and many are those who have no life for it, as day after day most of the common man works his way into a golden grave, bunker to protect himself from a simple life.

It is in fact, extremely difficult to defend that the notion and nature of money is lacking symbolic exploration, as for centuries it has been marveled and criticized by countless artists, writers and philosophers. However, even today, although there is widespread agreement among economists and researchers that money is important, there is still a lack of agreement on how to define and measure money.

The aim of the current dissertation is not to understand symbolic or even the psychological characteristics making people to use money. Instead, the objective of the current essay is to comprehend the functional and structural reasons making a simple object retain so much importance: Why do people use money? What is money's utility?

To really understand the true nature of money and the current conditions making it being widely used, it becomes fundamental to understand its origins and role through history and to comprehend how is it created and managed in modern societies. Only by doing as so will it be possible to grasp the true meaning and real importance of this tool that has been writing and re-writing history, raising and perishing civilizations as alchemists manage to transform and bend the rules of society replacing the force of law by the force of gold.

Structure and objectives

The current essay reviews and explores a vast variety of authors and theories aiming to depict an articulated and simplified overview of the monetary system, to properly understand the true functional utility of money.

To this end the current essay is divided in three distinct chapters.

Chapter 1, initially analyses the origins of money, exploring how money came to be, its evolution since early civilizations and its role within society. The second part of the chapter approaches the two main theories explaining what money is and what gives it value: the Metallist vs. the Chartalist theories. This section explains why money came into existence in the first place, what functions did it perform and how have those functions been changing over time. It represents the evolution of the functionality of money.

Chapter II firstly explores how the modern monetary system functions and secondly how commercial banks operate. It starts by exploring the official types of money, its categories and the agents responsible for its creation. Subsequently, some of the general misconception associated to the monetary system are explained, followed by the explanation of the real process behind money creation. It continues by analyzing the requisites for a bank to stay in business, some of the regulation used to restrain bank lending and its limitations, and finally, it briefly explains how deregulation played a key role empowering commercial banks conglomerates.

This chapter reflects how the structure of the modern monetary system is dependent on the role of commercial banks, which are responsible for the creation of most money within the economy and which, due to many decades of successive governments dismantling the regulatory system , face little to none limitations taking advantage of that power to achieve their own agenda.

Chapter III concludes this thesis developing some of the consequences of the current monetary system, exploring how the actual process through which money is created and put in circulation produces a systemic necessity and a dependence on continuous money creation and therefore a necessity to use money.

Chapter 1: The evolution of the functionality of money

Before any further development, to enable a clearer understanding of the issues approached within this section, it is essential to have a starting definition of what money is. For centuries, regardless of its form - coins, cash, cheques, credit/debit cards or digital - money has been clearly performing four essential functions (Davies, 2002):

(i) Money as a mean of store of value, enabling the population to hold it for future access of goods and services, without easily deteriorating; (ii) Money as medium of exchange, facilitating trade, replacing barter relations due to its general acceptance consequently surpassing the double coincidence of wants dilemma, which required both parties to have exactly the right quality and quantity of a commodity to make an exchange. (iii) Money as a unit of account, a generalized and agreed upon unit of measurement of value, to enable debt settlement and the establishment of an effective price. (iv) By fulfilling this conditions, money becomes a mean of final payment or settlement, an accepted way to settle a debt.

In sum, money is a token that can be used as unit of account, a medium of exchange, a medium of value storage and finally a medium of final settlement. In other words, money, as a starting definition for the current essay, can be seen as any object used by society to evaluate, measure and exchange most of the commodities within an environment and to extinguish obligations among people.

1.1) The origins of money

At the same time as there is some consensus that the functions of money are all important in constituting money, there is less agreement about their relative importance and role in the origins of money.

Consequently, within the scope of the current dissertation it seems important, before any other development, to better understand how money came to be, its evolution since early civilizations and its role within society. Only by doing so, will it be possible to properly comprehend some of the reasons behind the utility of this instrument.

1.1.1) The orthodox theory – Barter

The most famous theory of the origins of money, as Ryan-Collins, et al. (2011) explain, states that on the absence of means of exchange ancient civilizations had to resort to direct trade, or barter, in order to access different goods and services. Within a barter system both trading parties had to have something the other person would want for an exchange to occur. This requisite is known as the double coincidence of wants and requires both parties to have exactly the right quality and quantity of a commodity to make an exchange.

To explain a society within this scenario, Fair, Gartner, and Heather (1996) illustrate:

> "*Suppose you want croissants, eggs and orange juice for breakfast. Instead of going to the grocer's and buying these things with money, you would have to find someone who has these items and is willing to trade them. You would also have to have something the baker, the orange juice purveyor and the egg vendor want. Having pencils to trade will do you no good if the baker and the orange juice and egg sellers do not want pencils. A barter system requires a double coincidence of wants for trade to take place. That is, to effect a trade, I need not only have to find someone who has what I want, but that person must also want what I have."* (p. 564)

In order to surpass the inconvenience of barter through time, some commodities such as metal, started to be used as means of exchange for goods and services. This theory suggests that metal naturally emerged as currency due to its inherent features such as intrinsic value, portability, durability, divisibility. Through time governments began minting coins in order to standardize quantities and ensure purity.

This theory of the genesis of money can be found in most of the modern economics textbooks and became popular due to its use by Smith (1776) in the iconic *The Wealth of Nations*, which has been strongly influencing and shaping economic the monetary literature produced during the last few centuries. According to this branch of economic theory, money is simply a token that serves to oil the wheels of trade and it can be thought as simply as a "veil" over barter, masking the fact that people are still just exchanging one good or service for another. Consequently, doubling the supply of money would simply cause prices to double, so in real terms no one would be any better or worse off.

The great problem of the barter theory regarding the genesis of money, as stated by Humphrey (1985), is that no examples of a barter economy has ever been described, with all available data suggesting that there never has been such a thing. Humphrey (1985) continues by explaining that the search for coincidence of wants was not a necessary condition for a civilization to operate before the emergence of money. The concept of barter has been misconstrued by classical and neoclassical economics making it a creation-myth of the origins of money and consequently of the modern capitalism.

1.1.2) An alternative view, the debt systems

Graeber (2011) advocates that there is no evidence that money emerged from barter, and an enormous amount of evidence suggesting that it did not. This alternative perspective suggests that before the existence of money people did not engage in barter trades, except in ceremonial circumstances. Goods and services were handed based on the assumption that the counterpart would later return the favor. It was an intercommunal credit-debt system, a complex web of favors among individuals and families within communities.

Using Joshua and Henry cases, two members of a small intimate community like Nambikwara or Gunwinggu, Graeber (2011) explains:

> "*Henry's wife is chatting with Joshua's and strategically lets slip that the state of Henry's shoes is getting so bad he's complaining about corns. The message is conveyed, and Joshua comes by the next day to offer his extra pair to Henry as a present, insisting that this is just a neighborly gesture. He would certainly never want anything in return. It doesn't matter whether Joshua is sincere in saying this. By doing so, Joshua thereby registers a credit. Henry owes him one. How might Henry pay Joshua back? There are endless possibilities. Perhaps Joshua really does want potatoes. Henry waits a discrete interval and drops them off, insisting that this too is just a gift. Or Joshua doesn't need potatoes now but Henry waits until he does. Or maybe a year later, Joshua is planning a banquet, so he comes strolling by Henry's barnyard and says "Nice pig" (...)*" (p. 35)

On the previous example some conceptual dilemmas emerge: It is clear that Henry owes Joshua, but exactly what? How can a favor be quantified? On what basis can it be said that this many carrots, or this cattle unit, seems more or less equivalent to a pair of

shoes? The attempt to quantify these kind of debts and credits were the first steps toward the development of money as a unit of account.

However, for Graeber (2011), the most influential event toward the creation of real money was the moment in history when individuals started calculating much more specific debts to society, such as systems of fines, fees, and penalties, or even debts owed to specific individuals. In fact, he states that in English the word "to pay" is originally derived from a word for "*to pacify, to appease*" , to give someone something precious to express remorse and to avoid possible conflicts.

From an historical perspective, the earliest detailed written evidence of monetary relations is to be found in the financial systems of Babylon, Mesopotamia and ancient Egypt around 3000/2500 BC. These civilizations used banking systems thousands of years before the first evidence of commodity money or coinage, aiming to record and quantify the social credit-debt relationships of growing populations (Davies, 2002).

Only with the development of upper classes, temples, palaces and communities, and consequent creation of standardized tax payments, was the framework that resulted in the emergence of money as a unit of account formed. Widely used commodities such as wheat or barley became the first forms of generalized payment units. Money originated then, not as a cost-minimizing medium of exchange as in the orthodox story, but as the unit of account in which debts to the palace, specifically tax liabilities, were measured. After a certain period, some of these commodities due to its use to pay taxes, started to become generally accepted as a form of final settlement among the population (Innes, 1913; Wray, 1998).

The increased use of commodity money associated with the solidification of the taxation system, allowed the earliest prototype banks starting to perform activities beyond the registering based activities. Temple and palace complexes of ancient Mesopotamia soon started making interest bearing loans to merchants and farmers.

In the particular case of Egypt, not grain but also gold and silver were used as units of account, however there is some doubt as to what extent were they used as medium of exchange, especially for the majority of the population. Despite the existence of metallic money, it was grain which formed the most extensively used unit of account and medium of exchange (Davies, 2002).

Only between 600 and 500 BC, due to widespread period of war and violence, was there a shift from this mentioned debt and credit system, anchored in agricultural commodities, to a generalized exchange system based on the use of precious metals. The increased instability within the regions, and the increasing mobility of populations, accounted by the increasing number of armies and passing by mercenaries, were some of reasons influencing this shift. In regions such as Northern China, India and the Aegean Sea, soldiers could not be included in a credit-debt system because they were constantly moving. As these men tended to have access to gold and silver made loot, those kind of commodities started being accepted as mediums of exchange and settlement. As Graeber (2011) concluded:

> *"On the one hand, soldiers tend to have access to a great deal of loot, much of which consists of gold and silver, and will always seek a way to trade it for the better things in life. On the other, a heavily armed itinerant soldier is the very definition of a poor credit risk. The economists' barter scenario might be absurd when applied to transactions between neighbors in the same small rural community, but when dealing with a transaction between the resident of such a community and a passing mercenary, it suddenly begins to make a great deal of sense (…) As a result, while credit systems tend to dominate in periods of relative social peace, or across networks of trust (whether created by states or, in most periods, transnational institutions like merchant guilds or communities of faith), in periods characterized by widespread war and plunder, they tend to be replaced by precious metal."* (p. 213)

Credit systems that tended to dominate in times of relative social peace and trust, were replaced by an exchange system anchored in precious metal due to periods of widespread war, plunder and increased uncertainty. With the increased acceptability of gold and silver as means of exchange, precious metals gradually became the prominent form of money.

According to Jevons (1896), this change naturally happened as metal commodities gather a larger number of "money-like properties", as intrinsic value, portability, divisibility, and homogeneity, naturally becoming adopted as money over time. Gold and silver coins by possessing all these properties, became the dominant form of money over time.

This theory regarding the "money-like properties" of some commodities is known as the Metallist theory of money, or the commodity theory of money, due to the centrality of the commodity itself determining the nature of money (Ryan-Collins et al., 2011).

With the increased acceptance of gold and silver, jewelers soon began stamping these precious metals with their insignias, by doing so coins were created. However this private money was almost immediately suppressed by coins manufactured by rulers who would introduce them by paying their armies with it, and then by levying a tax on the entire population payable only in those coins, would ensure their generalized acceptability (Graeber, 2011).

Davies (2002) states that the cradle of coinage on the western world can be traced to the nations of Lydia and Ionian Greece between 750 BC and 400 BC. By the fourth century BC in Greece, a more modern form of banking had developed, known as the merchant banks, which in addition to lending, engaged in deposit taking, the processing of payments and money changing. While Roman banking developed a few hundred years later than the Greek banking, its activities were largely confined to the financing of land purchases.

After the collapse of the Western Roman Empire in the 5th century AD the widespread use of coins and banking largely died out in Western Europe as the population reverted to peasant farming and local production, with trade conducted largely on credit-debt systems as on ancient times. Meanwhile, the control of trade and money passed to the Eastern Roman Empire.

1.1.3) The emergence of modern banking and the rise of fiat money

Banking activities as the ones in Greek and Roman civilizations were only able to restart in Western Europe in the 12th century following improvements in numeracy, literacy, and financial and trade innovations. During late medieval and early Renaissance Italy, around 14th century Florence, families as the Bardi, Medici and Peruzzi started dominating the banking sector and were responsible for the spread of branches, and therefore banking, throughout the Holy Roman Empire (Spufford, 1988).

It was between the end of the 16^{th} century and beginning of the 17^{th} that a new practice appeared, completely revolutionizing the concept of money and what it accounts for. For centuries, silver and gold coinage were the main form of State currency, and through time, goldsmiths started offering safekeeping services for coins, bullion and other valuables, making a profit from vault storage fees. To every depositor would be given a

deposit note of an equivalent sum as the one deposited, which were to be handed whenever costumers needed to access the deposited gold. Soon everyone found out that instead of carrying pieces of gold, it was a lot more practical to simply use the deposit receipts directly as means of exchange, as people accepted them to make payments among themselves (Davies, 2002).

With the spread use of receipts, people would rarely come back to goldsmiths to withdraw their valuables. Understanding that, goldsmiths discovered that they could make a profit by issuing and lending additional promissory notes to borrowers and charging an interest rate on the loan. Goldsmiths could increase the quantity of deposit receipts in circulation, without any additional gold. The only requirement for this practice was to have a small percentage of what was lent to cover any eventual withdrawal. Through these process of creating new "money", fractional reserve banking was born.

The name fractional reserve is associated to the fact that gold held in the vaults was only a fraction of the promissory notes it supported. This concept worked because only a few people would usually come for their gold at one time. Consequently, only a fraction of the total loan value was needed to face the demand for gold.

As Ryan-Collins et al. (2011) argues, along with many other scholars, during this period and through this process, goldsmiths were committing fraud by stating that they actually held in reserve gold to support their deposit receipts. The receipts were fictitious representations of gold that did not exist. In this regard Ryan-Collins et al. (2011) state:

> *"(...) they were pure credit and had nothing to do with gold. But no-one could tell the difference between a real deposit receipt and a fictitious one.*"(p. 91)

During the seventeenth century, as the United Kingdom urgently needed a way to meet the demands of the Civil and French wars, this practice became legally accepted and consequently, goldsmiths' fictitious deposit receipts became legal tender. This represented a very significant step towards the creation of the first form of paper money, or banknote, in Europe.

Geisst and Charles (2005) suggest that in Europe, banknotes were first introduced on a regular basis in Sweden in 1661 by Stockholms Banco, a predecessor of the Bank of Sweden, however this experience was short-lived. The Bank of England declares that the

first bank initiating a permanent issue of banknotes was the Bank of England itself. In 1694 the first British central bank, the Bank of England, was established to raise money for the funding of the war against France, beginning to issue notes in 1695 with the promise to pay the bearer the value of the note on demand (Bank of England website).

Until this time in history most forms of money in circulation, with few exceptions[1], had its value driven directly from the value of the commodity from which they were made of, representing a kind of commodity currency standard. On the other hand, goldsmiths' receipts, followed by the banknote, represented the first steps toward a new monetary standard known as the gold bullion standard, or simply the gold standard (Ryan-Collins et al., 2011).

Within this new system, the main form of money in circulation was currency, a form of paper money convertible into gold. The spread of this system led to a decrease of importance of gold and silver coins as the main means of exchange. Instead, those kind of precious metals became the ultimate form of money used mostly among banks and countries to settle their activities. Among the general population currency, in the form of paper money or banknotes, became the new generally accepted means of settlement, units of account, store of value and mediums of exchange. The value of currency depended on the amount of gold a government promised to pay the holder of banknotes (Mehrling, 2012).

This system lasted until the twentieth century. Ryan-Collins et al. (2011) suggest that the first events alerting to the fall of the gold standard are associated to the American Civil war and the creation of the greenbacks which were a temporary form of legal tender not backed by gold, silver or anything else. Its value derived directly from government power and law.

With the onset of the World War I, the British government once again became in desperate need of funds to raise finance for the war. Consequently, following the American example, the United Kingdom in 1914 unofficially ceased the conversion of banknotes into gold, starting to issue its own money without being backed by any precious metal. By doing so the UK abandoned the gold standard.

[1] As the ancient Chinese paper-money, known as Chao, which was a form of money that was now backed by any precious metal, which acceptance and value came entirely from the power of the State (Van Glahn, 1996).

After the war some of the countries which during this period abolished their currency conversion, such as France, attempted to restore it once again believing that this would reinstate stability to the international financial system. However, some differences were implemented. In some of those countries, such as the United Kingdom, the public could no longer exchange bank notes for gold coins, only for gold bullion (Ryan-Collins et al. 2011)

In 1931, following a period of financial disturbance as a consequence of the beginning of the Great Depression, concerns began to surface around the western world. Due to the fear of inflation and currency devaluation that was haunting Europe, there was a drastic increase on the numbers of conversions of currency into gold, as it still represented the ultimate form of money. Unable to meet the demand for gold and to stop these gold runs, on 19 September 1931, the United Kingdom abandoned the gold standard and by this time a lot of other countries had either already left the gold standard or would do it soon after.

The Great Depression and inter-war instability were some of the reasons leading to the shift of power from the pre-war dominance of the British sterling to the new global reserve currency, the US dollar, and the shift of the role of the global financial system supervisor from the Bank of England to the United States Federal Reserve (Ryan-Collins et al., 2011).

Following World War II, a two-decade period of relative financial stability arose in most of the Western world, and a new monetary international standard was developed. In 1944 the Bretton Woods conference started and a consequent agreement was developed providing a fixed exchange rate of all currencies against the US dollar, which in its turn was convertible into gold at a fixed price. Within this system all currencies were convertible into dollars which was then convertible into gold. This system lasted until the 1970s, when the United States found itself unable to live up to the promise to convert dollars into gold.

European analysts accused the United States of abusing the system by simply creating too many dollars. With the created currency US firms were easily buying European companies and assets. Noticing the American misuse of the system some nations, namely France, responded by demanding the conversion of their dollar balances into gold. In response to those demands the American president, Richard Nixon, was

forced to cancel the dollar convertibility into gold, and this moment became the last stage before money finally became fiat currency (Ryan-Collins et al., 2011).

Fiat currency is a type of currency which value derives from government regulation or law, with no conversion into precious metals or any other kind of commodity (McLeay, Radia and Thomas, 2014).

By 1976 all the world's major currencies were allowed to float freely against each other.

1.1.4) The Dematerialization of money, the electronic money

In the current essay it has been shown how money has evolved throughout history, from barley and whit, to gold and silver, to paper as promises of gold, until it finally became simple pieces of paper materializing governments' power. Still, until now, either in the form of gold coins or banknotes, money always had a physical form. However, as a consequence of the last few decades and the information and digital revolution, even this was going to change.

The great developments in information and communication technologies had a tremendous impact on what is considered and used as money, and how it is exchanged. The appearance of bank cheques, followed by debit and credit cards, and then by internet banking, were some of the milestones enabling the creation of electronic/digital money (Ryan-Collins et al., 2011).

Electronic money or digital money, is defined by the European Central Bank, as an electronic storage of monetary value on a technical device that may be widely used for making payments to entities other than the electronic money issuer (ECB website). The operation mechanism is based on the transfer of bank deposits as means of payment, as they can easily be moved around with the use of debit cards or electronic bank transfers. Its creation has drastically reduced the status and importance of cash - banknotes - as a medium of payment, exchange and store of value.

Bank deposits are promises from banks to deliver cash/currency on demand. Compared to it, banknotes present some significant drawbacks, such as being harder and less safe to move, store and carry in larger amounts. Through a simple plastic card, or

even with a simple click, great amounts of currency can be stored and transferred with relatively low risk when compared with its physical counterparts. (McLeay et al., 2014).

For these and other reasons, nowadays practically all money in circulation is electronic money, through the form of bank deposits. Ryan-Collins et al. (2011) state that in the UK, this financial instrument has been showing an exponential growth since it was first introduced. In 1982, the ratio of coins and notes to bank deposits was 1:12, as by 2010 this ratio had risen to 1:37. McLeay et al. (2014) estimate that on the UK economy, at the beginning of 2014, around 97% of the money supply was bank deposits.

In words of Ryan-Collins et al. (2011):

> "*Cash is still used for what numerically is the majority of transactions, but the majority of transactions are very small … Digital money… is used almost exclusively for larger transactions and hence accounts for the majority of transaction volumes. This is because of the convenience of credit and debit cards and, increasingly, online banking where the volumes are considerably larger"* (p.116).

This reference reflects how bank deposits have been performing the role traditionally played by banknotes, being accepted as a medium of exchange, store of value and final settlement. Analyzing the role of electronic money on the modern financial system, it becomes very difficult not to consider bank deposits as money.

In fact with the exception of a tiny fraction of cash, money which once was tangible commodity as grain or silver, on this digital era it is less tangible than it has ever been. It is basically information, as enormous volumes of money are moved around our economies simply by people typing data into computers. As stated by Ryan-Collins et al. (2011), the binary language of a computer is the closest representation to what money is today.

1.2) What is money and what exactly makes it valuable?

Taking into consideration the genesis and evolution of money through men's history, can an answer clarifying what is money and why does it bears such importance role already be achieved?

The "what" part has already been explored in the current essay, as Davies (2002) explains, money is a unit fulfilling four main tasks: being a unit of account, a medium of exchange, a form of value storage and form of final settlement. However this answer is incomplete. In this particular case the "why" becomes fundamental to properly understand the "what". Why can some units or commodities be considered money and others not? Why barley and not rice? Why gold and not marble? What are the characteristics that make a unit capable to perform such roles? Are the reasons behind the physical characteristic of the objects used? If so what about digital money?

Miller and Van Hoose (1993) concluded their chapter on money:

> *"Although there is widespread agreement among economists that money is important, they have never agreed on how to define and how to measure money"* (p. 42).

The current section aims to explore some of these dilemmas and to clearly answer the question "What is money and what exactly makes it valuable?".

1.2.1) Money: Metallist vs Chartalist

a) Metallism

Regarding what is money and what makes any object a suitable candidate for that title, there are two main schools of thought suggesting an explanation for these dilemmas.

The first theory, the Metallist perspective, also known as the commodity theory of money, postulates that money spontaneously arose in the private sector in order to eliminate some of the inefficiencies of barter. Thus, society agreed upon some means of exchange denominated as "money" in order to overcome some of the transaction costs associated with barter. Within this theory money was spontaneously originated as a medium of exchange, though it may come to serve other functions (Bell, 1998).

A second suggestion associated with the Metallist school of thought is the centrality of the commodity itself determining the nature of money (Bell, 1998), as commodities with certain specific characteristics, would naturally become accepted as mediums of exchange and consequently units of account, storage of value and means of settlement, money in other words (Jevons, 1896).

According to Jevons (1896), some of these characteristics were:

Intrinsic value (i), since money has to be exchanged for valuable goods, it should itself possess value, and it must therefore have utility as the basis of that value. It may even seem that in the case of some historic currencies, as shells, bits of leather, scraps of paper, money does not really require to have substantial value, however there must always be a sufficient reason inducing people to accept money, such as the force of habit or legal enactment.

As in early stages of society, the use of money was not based on legal regulations, the author proclaims that the utility of the substances initially used must have been the fundamental criteria. In fact, most currencies as corn, skin, tobacco, salt, cacao, which have performed the functions of money possessed independent utility and value, any apparent exceptions to this rule would doubtless admit of explanation by fuller knowledge.

Some examples could be the wampum, found in circulation among North American Indians, which was used for the purpose of adornment, or the widely used cowry shells, valued for ornamental purposes on the West Cost of Africa, used as small currency in the East, which indicates that this commodity was probably employed as ornaments before being used as money.

Portability (ii) of money is an important quality not merely because it enables the owners to carry small sums in the pocket without trouble, but also because large sums can be transferred from place to place at little cost.

Durability (iii), if money is to be passed about in trade and kept in reserve, it must not be subject to deterioration or loss in order to retain its value.

Homogeneity (iv), all portions of the substance should have similar characteristics in order for them to have equivalent values and equal weights must have the same value.

Divisibility (v), If units are equal and similar the material used has money should not only be able of being divided, but the aggregate value of the mass after division should be almost exactly the same as before it has been divided.

The Metallists argued that society settled on a metallic currency (gold, silver, etc.) as metal clearly fulfilled all the previous conditions. That is why barley, grain and most agricultural goods used as currency by ancient civilizations were replaced by gold and

silver, because the first group have less “money-like properties” when compared to the second, for example inferior durability, as those commodities decay or putrefy.

Within this theory the State's role have been limited to encourage the continued use of gold and silver by assuring the integrity of the precious metals, managing its quality and quantity, but their power would have been narrowed to supporting the will of the private sector.

With the emergence of currency, the Metallist vision easily adapted to the use of a “non-pure” commodity such as copper based coins or banknotes, by arguing that currency could be substituted for commodity money (mainly gold) and consequently their metal backing would infuse them with value. When governments suspended convertibility for certain periods of, Metallists maintained their position by explaining that currency retained its value because people expected convertibility to be restored. The end of the Gold Standard, became the biggest dilemma for Metallist theory as the elimination of a metallic backing, appears to rob paper currency of its value (Bell, 1998).

That is, in words of Laidler (1987):

> *"(...) the value of commodity money might appear to derive from that of the commodity from which it is made, or into which it is convertible, and the value of credit money from that of the assets which back it, . . . no such factor seems to explain the value of fiat money"* (p. 20).

Why society continues to accept intrinsically worthless paper currency after the elimination of a metal standard became the biggest challenge to Metallist theory of money (Bell, 1998).

b) Chartalism

The second school of thought regarding what gives money its value is known as the Chartalist theory. This theory does not view money as a commodity with exchange value, scarcely different from any other commodity. Thus, unlike the Metallist vision, the Chartalist view is not preoccupied with the medium of exchange function of money. Quite the reverse, Chartalist theory seeks to reveal the essential properties of money as a unit-of-account and a means of payment. To this end, Chartalist theory take in consideration

the social and historical origins of money and, unlike the Metallists' vision, provides a non-market-based theory of money (Bell, 1998).

The Chartalist theory, in its most general form, is perhaps best described in Friedrich Knapp. Knapp (1905) suggests that the State plays a central role in the development and establishment of money. Tcherneva (2006) defends that the Chartalist perspective sees money as a social debt relationship, as money first arose as an acceptable way of resolving inter-communal debt obligations (a unit of account), and only subsequently became widely adopted in market transactions.

As previously mentioned, and in line with the Chartalist doctrine, the creation of standardized tax payments that emerged with the development of upper classes, temples, palaces and communities, was the main reason behind the emergence of money as a unit of account. Widely used commodities such as wheat or barley became the first forms to settle taxes with these complexes and after a certain period, due to this particular function, became generally accepted as a form of final settlement among the population. Money originated then, not as a cost-minimizing medium of exchange as in the orthodox story, but as the unit of account in which debts to the palace, specifically tax liabilities, were measured. (Innes, 1913; Wray, 1998).

Consequently, history reveals that the power of the public authority to delegate taxes and determine how they will be paid, played a fundamental role in establishing a universal equivalent for measuring debts and in determining what thing (grain, barley, gold or paper) will be used to correspond to this accounting measure. This theory gives a clear explanation why money has value: the obligation to pay taxes in a unit established by the State, attributes value to the chosen unit (Goodhart, 2003).

The legitimate and sovereign powers of the governing body renders money "a creature of the State" (Lerner, 41947). Chartalism recognizes that money cannot be appropriately studied in isolation from the powers of the State. It postulates that money is a unit of account, designated by a public authority for the codification of social debt obligations and more precisely, in the modern day, this debt relation is between the population and the nation-state in the form of a tax liability. Money is a creature of the State and a tax credit for extinguishing this debt, it functions, first and foremost, as an abstract unit of account, which is then used as a means of payment and as a settlement of debt (Bell, 1998).

As Bell (1998) illustrates, in the USA, the unit of account is the dollar, and because the government's currency is the only legal means of discharging periodic tax liabilities, the population will continuously need dollars. Because the private sector will always be indebted to the government in dollars, the population will prefer to write all money contracts and make all promises in terms of dollars, as they will always need the designated currency to settle their debts with the State. Consequently silver, paper, gold or any other thing only serves as a medium of exchange, which is an empirical manifestation of what is fundamentally a state-administered unit of account. The population starts exchanging whatever the State established as a unit of account due to its utility to pay taxes and settle with the State. Consequently, the function of money as a medium of exchange is simply a consequence of its first two functions as a unit of account and a means of payment

The importance of the historical record is that first the nature of money as a social debt relationship, second, it highlights the importance of public institutions in establishing a standard unit of account, and third, it demonstrates that money was a pre-market phenomenon, representing initially an abstract unit of account and means of payment, and only later a generalized medium of exchange (Bell, 1998).

As stated by Knapp (1973):

> *"It is beside the point what material will be used to correspond to those units of value. Money is a 'ticket' or 'token' used as a means of payment or measure of value. The means of payment 'whether coins or warrants' or any 'object made of a worthless material' is a 'sign-bearing object' to which '[state] ordinance gives a use independent of its material', There is nothing spontaneous about its existence; rather, it is contingent on what the State has declared to accept in payment of taxed, fees, and dues at public offices."* (p.32).

1.2.2) Money and its Hierarchy

Keynes (1930) makes a distinction between money as a unit of account, which is related to the description or title of the unit used as money (for example the euro), and money as the thing which answers to the description (such as banknotes or bank deposits). It is because different things do answer to the description of the unit of account that there exists what is referred by Minsky (1986) as a hierarchy of money. The description or title

is the unit in which all money in the hierarchy is denominated. As Bell (1998) illustrates, in the USA, the unit of account is the dollar, subsequently all money in the hierarchy is dollar-denominated independently of the thing used in the exchange or settlement process.

Understanding the difference between the elements within a hierarchy of money is to understand the concept of credit. In fact, it is practically impossible to talk about money without mentioning credit and debt (Minsky, 1986).

As seen, Davies (2002) defines money as a unit through which each people can measure, exchange, store and settle things among themselves. Credit, on its turns, is simply an extension of money, a promise to pay money and a way of delaying final settlement. Credit is the other side of debt, as the delay of the payment generates a commitment to settle on a future date, in other words, credit generates debt by allowing an exchange of money today for a promise to pay it back in the future (Mehrling, 2012).

Credit money is a financial asset to its owners, depositors, and a financial liability its issuers, generally commercial banks. Unlike gold it is not created outside the banking system by central banks or the government, as its supply is endogenously created by the extension of bank credit.

Credit money does not exist as given "stock." as its flow supply changes continuously over time, as the demand for bank credit, and it can only exist because it is anchored to the belief that the exchangeability of credit money into legal tender is a precondition for monetary exchange (Moore, 2006).

Understanding the former definitions is fundamental to comprehend the differences between the different levels within the hierarchy of money. To illustrate the hierarchy of money concept, Mehrling (2012) uses a simplified model under the gold standard, where gold is seen as the highest level of the hierarchy. Within this model, he suggests that all descriptions answering to the unit of account are a type of credit. National currencies being backed by gold, can be seen as a form of credit as currency is a mere promise to pay gold on demand. Anyone could go to a national mint, and find the rate of one dollar for a certain amount of fine gold (Young, 1929). A step down in the hierarchy, bank deposits can also be seen as a form of credit as they are promises from the banks to deliver cash/currency on demand. In a more complex perspective they are promises to

pay on demand, promises to pay gold. Securities, are also a form of credit, as they are promises to pay currency over some time horizon in the future.

This information might suggest that within the gold standard only gold could be considered money and everything else is a form of credit, however Mehrling (2012) makes a different argument. The dividing line between money and credit depends on the user of the instrument. For a country settling its international accounts, national currency is of limited value. What other countries want is their own currency, or the international means of settlement, such as gold in the case of a gold standard, or perhaps Special Drawing Rights (SDRs) from the IMF in the modern system. These users, they might be inclined to see gold or SDRs as money and everything as credit.

Just as so, for a bank settling its accounts at the end of the day, currency is already accepted as a mean of settlement. Alternatively, for ordinary people, not only currency but also bank deposits are forms of final settlement. Bearing in mind this information, it can be considered that any agent might be inclined to view as money the instruments they accept to settle amongst themselves and everything else as a form of credit.

Mehrling's (2012) illustration is useful to understand how deposits, or any other instrument, are seen as money or credit depending on the users. The reality is that all instruments, except gold, are liabilities at some level. Currency is a liability of the central bank, as bank deposits are liabilities of commercial banks and so on.

The development of the gold standard, within this perspective, can be seen as a solution to the problem of what to use for an international stateless money, the form used for States to settle among themselves.

When exploring the differences within the hierarchy of money in a country, Minsky (1986) tried to understand what drives the acceptance of the different instruments in an era without the gold standard. When analyzing the acceptance of bank deposits, he realized that bank promises or bank deposits are accepted by the public not only because they are backed by law, not because they are convertible into anything else but because they are accepted in payment to creditors. Likewise, government's promises, as currency nowadays, do not depend on convertibility into anything else. Neither governments nor banks rely on convertibility for acceptance of their promises, since what makes them both acceptable is not convertibility into something else but acceptance in payment to one's creditors. In line with this conjecture, Tobin (1998) states:

> *"[i]f my creditors will take marbles in settlement of my debts to them, why should not I in turn take marbles from my debtors?"*(p. 27).

Ultimately, the former concept suggest that what gives value to money, goes beyond the power of the State to determine what things might be used to pay taxes. The real property giving money its value is its general acceptance and money is ultimately a social relationship (Tobin, 1998). An instrument position within the hierarchy depends on the degree to which it is accepted by society.

For Metallists gold's acceptability is related to its inherent characteristics, being the ultimate form of money at the top of the hierarchy. On the other hand, for Chartalists currency is the most acceptable form of money in the pyramid because it is backed by the power of the government. In a sense, the State, unlike any other issuer of promises, can "force" the acceptance of its liabilities by demanding individuals to pay taxes. In order to avoid punishment, the population has to acquire and accept State's money so it can settle with the State itself (Bell, 1998).

In reality, a great number of things can answer to the description/title of money, that being, every plane ticket, pre-paid phone card, movie ticket, subway token, and so on, simply depending on its acceptability. Ultimately, acceptability independently if it is due to the force of habit, or the power of law, is what gives anything the status of money (Keynes, 1930; Bell, 1998).

McLeay et al. (2014) define money as a special kind of IOU[2] (I owe you) that is universally accepted, either if in the form of currency printed by the central bank, deposits hold in commercial banks, etc...

The spread of the acceptance, either due to the power of the State, or simply because of a new trend, is the why behind money. In other words, any unit used as a unit of account, store of value, medium of exchange and settlement, has its value driven by the generalized acceptance of the population.

Chapter analysis

[2] IOU – an abbreviation for I owe you, is usually an informal acknowledgment of debt.

After analyzing the role and evolution of money through history, the current research seems to indicate that money first emerged as a unit of account to measure and quantify debt relations within a society, namely to quantify fees and penalties, and most of all to measure the amounts owed to temples and communities due to the implementation of tax systems. Only then money emerged as a means of payment used to extinguishing those debts, and later on, due to its increased acceptability as a medium of exchange.

However, some of the points made by the Metallist theory of money, primarily related with the money-like properties of money, also seem to make some sense. Even if money initially had its value driven from the power of the State, it does not mean that some commodities would not have certain properties that would make them better suited candidates to be used by this institution. Commodities with certain specific characteristics, such intrinsic value, portability, durability, homogeneity and divisibility seem to be better qualified for the role than others without some of this characteristics.

Independently from which is the reason behind the origin of money, it seems that general acceptance is the real reason giving value to it, as through history a variety of commodities performed as money even if not officially declared by the government. Some great examples can be seen during the colonial periods, as the cases of tobacco, wampum, whiskey and maize (Davies, 2002).

There is, in fact, some problems with the Chartalist origins of money theory, which proclaims that the State by creating systems of taxations was responsible for determining what became generally accepted as money. For example in some ancient civilizations, such as in Mesopotamia, in the Persian empire, and even in within the Romans, free citizens didn't usually pay taxes. (Graeber, 2011).

This statement does not completely invalidate the State theory of money, as States and governments still influenced what was accepted as money by levying fees, penalties, tariffs, and fines, and even if the role of the State in the genesis of money is not as important as thought, in modern societies it still represents one of the main reasons leading to the acceptability of currency. It simply suggests that the role of the State may not be as relevant as thought, and that it may not be the only reason behind the appearance of money. Consequently, it is important not to simply discard any of the arguments used

by the two different theories of money, the Metallists and the Chartalists, when trying to understand the reasons influencing the use and value of money.

Inferring from the research explored within the present chapter, it seems that there are at least two main reasons underlying the use of money.

The first reason, is a derivation from the centrality of money as a unit of exchange, the focus of the Metallist theory. Metallists say that money arose spontaneously in the private sector in order to eliminate some of the inefficiencies of barter, however, as seen a barter economy never existed. Either way, even if such an economy never existed, some principles behind the emergence of money within that context seem legit in the modern society. Within a society with the size and complexity of the present one, associated with a great variety of goods and services and a permanent creation of necessities, an intercommunal credit-debt system, such as the one used within ancient civilizations, would hardly allow such level of effectiveness satisfying this great variety of needs.

Saying this, even if the "barter theory" of the origins of money is wrong, its focus on the centrality of money as means of exchange can still be seen has one of the main reasons behind its use nowadays.

As previously seen, credit-debt systems faced enormous challenges, such as the increased complexity and mobility of the population and the great uncertainty within war periods, which due to the increased difficulty of keeping track of all credit-debt relations and to account all the transaction within an environment of growing dynamism, culminated in its replacement of these systems by money based systems, therefore the emergence of money as a unit of exchange.

Within this perspective money as a unit of exchange, seem to have appeared as a way to surpass the transaction costs associated to the necessity to register and account all the activity of a society growing in complexity. Due to its properties as a medium of exchange, people use money because it is the most efficient way to have access to a variety of means to satisfy their great variety of necessities.

The second reason, on its turn anchored in the Chartalist doctrine, is the necessity to settle with the State. To this point it must already be clear how the implementation of taxation systems create themselves demand for money. People need money, because they need to pay taxes.

Ultimately and summarizing the current chapter, people need and use money in a society not only to extinguish their obligations with the State, but also because money facilitates the access to a diversity of means to satisfy their needs, being those the main reasons why people this object.

Taking in account the Metallist and the Chartalist theories of money, all the functionalities of money such as being a unit of account, store of value, means of exchange and of final settlement, are either mere consequences from the necessity for people to find an efficient way to satisfy their necessities or from the necessity to settle their obligations with the State.

Chapter 2: Where does money come from?

Even if in theory almost anything can be used as money, legally there are financial assets that are recognized and accepted as money by most economic and legal agents when establishing relations amongst themselves, namely currency, deposits of different maturities and even repurchase agreements.

What becomes extremely interesting is the lack of knowledge of the general population regarding the mechanism through which these monetary assets are created and managed. What is the source from where official types of money come from? How are they created and by whom? How does money come into the hands of the general population and how does it circulate?

Within the present section some topics that will allow a clearer view of the official money mechanics are going to be explored, targeting a deeper understanding of the underlying causes related to the use of such assets in the modern world.

2.1) The monetary system

Within the current essay, and particularly in the present section, some of the main agents of the economy, such as the general population, firms and enterprises and the government are going to be explored, however the main focus of the current chapter will

be upon banks as they fulfill a fundamental role on the process through which money is created.

Subsequently, it seems appropriate to start by defining and distinguish the two most relevant forms of banking within an economic system: central and commercial banks.

If a monetary system can be comprehended as a set of institutions through which a government provides money to a country's economy, the central bank is the agent responsible for the supervision of the system. This agent is responsible for the management of the national currency, the money supply, the interest rates and it is accountable for the supervision of the commercial banking system, aiming to ensure an orderly functioning of the money markets and settlement system of the country it represents (OECD website; ECB, 2011)

Commercial banks, on the other hand, are financial institutions that provide services such as accepting deposits, making business loans, offering basic investment products, allowing inter-customers electronic payments and providing access to cash to the economy. Banking is commonly categorized based on the type of activities they perform and on the type of customers they work with. For example it can be divided in retail, wholesale, investment and so on. In the current essay the generic term of commercial bank is used to refer to all non-state deposit-taking, loan-making institutions, and to distinguish them from the central bank (Independent Commission on Banking, 2010).

As described by the ECB (2011), a monetary system operates in the following way:

The central bank is responsible for the formulation and implementation of the monetary policy aiming to ensure an orderly functioning of the money markets and to help credit institutions to meet their liquidity needs.

To achieve this, the central bank provides regular refinancing to credit institutions, as well as facilities that allow them to deal with end-of-day imbalances and transitory liquidity fluctuations.

On their turn, credit institutions such as commercial banks are the main counterparties of the central bank's policy operations and the main bridge between the general economy and the central bank.

For an effective implementation of the policies, the central bank uses key transmission procedures such as open market operations, standing facilities and minimum reserves, to affect the condition on which commercial banks operate, thereby initiating the process through which these conditions are transmitted to households and firms.

In the modern monetary system, central and commercial banks are responsible for the creation and circulation of most types of the official forms of money existing in the modern system. The present section, aims to identify those different types and explore the process through which they are created and put in circulation (McLeay et al., 2014).

2.1.1) Categories of Money and the process through which money is created

As previously mentioned, theoretically an infinite number of objects can perform as money. However, officially money is generally divided into four different categories regarding the different nature of an instrument. These categories are called monetary aggregates and are generally described as M0, M1, M2, and M3 (Table 1).

M0, also known as high-powered money, monetary base, or base money, comprises notes and coins in circulation (sometimes referred to as cash) and reserve balances at the central bank, which are a type of electronic money and a liability of the central bank, which just as cash, can be used by commercial banks to settle between themselves and the central bank.

M1 is a monetary aggregate which represents notes and coins plus current accounts, it comprises currency in circulation and deposits which can be immediately converted into currency or used for cashless payments.

M2, on the other hand, is a monetary aggregate that comprises M1 plus deposits with an agreed maturity of up to two years and deposits redeemable at notice of up to three months.

M3 is broader monetary aggregate that comprises M2 plus repurchase agreements, money market fund shares and units as well as debt securities with a maturity of up to two years (ECB, 2011).

It is fundamental to highlight the difficulty to keep an officially list of what can be considered money updated. In fact, defining money is inherently problematic as whenever a particular instrument or asset is publicly defined as money by an authority in order to better control it, substitutes are normally produced for the purposes of evasion. This situation is known as "Goodhart's law" (Goodhart, 1989).

Independently, most money used nowadays is either a liability of the central bank or of the private banks. In line with this, there are two terms used to classify monetary assets depending on its origins: base and broad money.

Base money includes all the money created by the central bank, just as cash and central bank reserves. Broad money, on its turn, besides the mentioned categories, includes a wider range of bank liabilities, such as bank deposits, repurchase agreements, money market fund shares, as well as other types of debt securities with a maturity of up to two years. However, for the sake of simplification, this article describes all of these liabilities as bank deposits (McLeay et al., 2014).

Summarizing, in the modern monetary system there are three main types of "official" money: cash, central bank reserves and commercial bank money.

a) Cash

Cash, representing banknotes and coins, is a physical form of money created under the authority of the central bank. It makes up the minority of the total money supply as in most developed countries it does not even represent 10% of the total supply. For example, according to McLeay et al. (2014), in the United Kingdom it only represents around 3%, further on, in line with data from the American Federal Reserve, the World Bank and the ECB, represented in Table 2 and Table 3 it can be also regarded that this value, between 2000 and 2012 as always been lower than 10% in both the Euro Area and the United States.

Cash is a liability of the central bank which is the entity responsible for the creation of coins and printing of banknotes. After being printed, banknotes are usually swapped with commercial banks by older notes, which are no longer fit to be used, which are then destroyed. If, by any reason, there is an increase on the demand for banknotes, to meet this extra demand the central bank may issue extra banknotes which are then sold to commercial banks in return of government bonds, financial assets or central bank reserves (McLeay et al., 2014).

The income associated to the interests from those assets, after deducting the costs of issuing notes, is known as seigniorage and it's usually paid over to the government, where it can be used to fund government spending, to reduce taxation, etc…

A similar process takes place with coins, with the main difference being that coins are sold to commercial banks at face value. The difference between the face value and cost of production is also seen as seigniorage (Ryan-Collins et al., 2011).

b) Central bank reserves

The second official form of money are the central bank reserves, which are a type of electronic money created by the central bank used to make settlements between commercial banks and between them and the central bank. McLeay et al. (2014) specifically define bank reserves as an electronic record of the amount owed by the central bank to each individual bank and vice-versa.

If a central bank wishes to inject central bank reserves into the banking system it can do so by lending them to commercial banks or simply by purchasing assets held by the banking sector, as bonds (Ryan-Collins et al., (2011). Central banks create reserves through a balance-sheet operation, by expanding their balance-sheet and increasing their liabilities on the value of the reserves they want to create, and at the same time increasing their assets on the same amount. The assets' increase can be made through the registering of a new bank loan to a commercial bank or through a purchase of a new asset to the same bank (McLeay et al., 2014).

These operations are mainly done through open market operations (OMOs), as repurchase agreements (repos) or through standing facilities that allow commercial banks to have access to liquidity in case of necessity (ECB, 2011).

Recently, a parallel method, which also allows to increase the amount of reserves in circulation on the banking system and to stimulate the economy, has also been developed. This method is based on a program of asset purchases and it is called quantitative easing (QE).

Instead of buying assets from the banking sector, the central bank buys them from the public, for example from a pension fund. Because the public does not have access to central bank reserves, the central bank credits a commercial bank account at the central bank with commercial bank reserves and the commercial bank, on its turn, credits its costumer‘s deposit account with newly created commercial bank deposits. The sellers of the assets will be left holding the newly created deposits in place of traded financial asset, generally government bonds (McLeay et al., 2014).

c) Commercial bank money

At last, the third official form of money, commercial bank money, commonly regarded as bank deposits. Bank deposits are merely promises from banks to deliver cash/currency on demand, and are officially accepted as a form of money. It is a liability of the commercial bank, and consequently unlike central bank reserves and cash, it is not created by the central bank. This type of money is created by private commercial banks, in the process of making loans or buying assets. Commercial bank money, as it can be inferred by the information previously regarded (McLeay et al.(2014); ECB database; FED website; World Bank database), represents more than 90% of the money supply in developed countries, and are simply a record of how much the bank itself owes its customers.

The Bank of England by publishing the articles *Money in the Modern Economy* (McLeay et al., 2014) broke with the conventional view of how money is created by explaining that commercial banks create money similarly to the way central banks create reserves, out of thin air:

> *“In the modern economy, most money takes the form of bank deposits. But how those bank deposits are created is often misunderstood: the principal way is through commercial banks making loans. Whenever a bank makes a loan, it simultaneously creates a matching deposit in the borrower’s bank account, thereby creating new money”.* (p. 1)

When a bank makes a loan, for example to someone taking out a mortgage to buy a house, it does not normally do so by giving them thousands of euros worth of cash. When a bank makes a new loan, new money that previously did not exist, comes into existence with the creation of a new bank deposit, or by crediting an already existing bank account. At the same time that new money in the form of bank deposits was created, also debt, owed to the bank, came into existence on an amount equal to the money lent plus interests and other fees.

Focusing on balance-sheets' operations, without considering the role of interests and other fees, both from the bank and from the costumer perspective, it is possible to see an increase on bank's assets, correspondent to the new loan, and an increase on the same amount on its liabilities, associated with the deposit now owed to the client. From the costumer perspective there is an increase on his assets, has deposits increase, accompanied by an increase on the same amount of its liabilities, as now he owes a loan to the bank (McLeay et al., 2014). This process is illustrated in Figure 1 which is used by McLeay et al. (2014). As revealed in the third row of that figure, the new deposits increase the assets of the costumer/consumer and the new loan increases their liabilities. New broad money has been created.

Likewise, both sides of the commercial bank balance sheet increase as new money and loans are created. While new broad money has been created on the consumer's balance sheet, the first row of Figure 1 shows that there was no change in the amount of central bank money or base money. As stated by McLeay et al. (2014):

> *"For this reason, some economists have referred to bank deposits as 'fountain pen money', created at the stroke of bankers' pens when they approve loans."* (p.3)

This money creation process also works when commercial banks buy assets. For example when buying a bond from a pension fund, the bond is recorded as an asset and the bank credits the pension fund's account with the equivalent value.

However, on the same way that new loans create money, the repayment of bank loans destroys money. With the repayment of a loan assets from the bank and the liability from the costumer are erased, as money is given back to the bank, it shrinks the amount of the debt and also the quantity of money in circulation. As McLeay et al. (2014) explains:

> "*For example, suppose a consumer has spent money in the supermarket throughout the month by using a credit card. Each purchase made using the credit card will have increased the outstanding loans on the consumer's balance sheet and the deposits on the supermarket's balance sheet (...). If the consumer were then to pay their credit card bill in full at the end of the month, its bank would reduce the amount of deposits in the consumer's account by the value of the credit card bill, thus destroying all of the newly created money*." (p. 3)

As an ending note, it must be highlighted that all commercial bank money, due the described process, is simply a form of credit and, consequently a form of debt. Most money within an economy is associated to an equal amount of debt and, as it is going to be further explored, not even the small amount which is not created by commercial banks and there for supposedly debt-free, can come into circulation without being tainted by debt.

2.1.2) General Misconceptions

The public, in general, lacks knowledge about how banks actually work and what is done with the funds provided to them (Evans, 2010). This section will be focused on some of the ideas commonly associated with banking, exploring some popular misconception, such as the idea that people own the money they deposit in banks, the concept of cash as debt-free money, and the money multiplier theory, which represents the widespread model behind the functioning of current monetary system.

a) I own my deposits.

As stated by Ryan-Collins et al. (2011):

> *"Most people will have had a piggy bank at some point in their childhood. The idea is simple: keep putting small amounts of money into your piggy bank, and the money will just sit there safely until you need to spend it. For many people, this idea of keeping money safe in some kind of box ready for a 'rainy day' persists into adult life."* (p.36)

The idea just described, is first of the many misconceptions held by the public. According Evans (2010), a poll conducted by ICM Research on behalf of the Cobden

Centre, found that a considerable amount of people (around 33% of the studied sample) thought that banks does not make use of the money in customers' current accounts.

In reality, banks not only make use of their client's deposits but, in fact, the deposited money legally belongs to banks. Bank deposits are not an amount of cash or coins that is held in banks waiting to be withdrawn, they deposits are simply promises from the banks to deliver cash/currency on demand, a record of how much the bank itself owes its customers. Worldwide there is not enough base money to cover the amount of bank deposits in circulation, as commercial bank money represents more than 90% of the money supply. If all the population would want to convert their deposits into the promised cash, the banking system would not be able to account for its promise (McLeay et al., 2014).

In other words, all the money held by the population in banks are simply promises from banks to deliver cash on demand. All the cash and coins delivered to this institutes, become their property in exchange for a promise and are used by banks to make other investments or supply the demand for cash of another customer.

b) Cash as debt-free money

When describing the process through each money is created, Ryan-Collins et al. (2011) claims that it is generally associated to one of the most widespread misconception regarding the monetary system: That is, cash is a source of "debt-free" money.

Normally when a central bank creates banknotes, people belief that it is spent directly into the economy and consequently starts circulating. However, in reality, commercial banks are the economic agents responsible for the supply of most banknotes and coins used by businesses and individuals. It is not common, being even rare for a central bank to spend cash directly into the economy and in fact what is thought to be the normal procedure, is actually the exception. Even when it happens, the amounts of money spent directly by the central bank, compared with those put into circulation through commercial banks, are simply insignificant.

For the public to access cash, it must withdraw it from the commercial banks. Through this process cash to come into circulation needs to be directly exchanged by bank deposits. Consequently, for money to be withdrawn and to come into circulation,

the customer must previously have access to a deposit account with bank deposits. As previously mentioned, bank deposits are created by commercial banks through the lending activity, with every cent of credit created being associated to an equal amount of debt (Ryan-Collins et al, 2011; McLeay et al., 2014).

The end result is that for the public to have access to banknotes, someone had to already have contracted a loan so the deposits could have been created and then exchanged for cash. The mentioned method represents the main way through which the public has access to banknotes and requires the existence of debt for cash to come into circulation, therefore all the money supply must be borrowed by commercial banks (Ryan-Collins et al., 2011).

c) The money multiplier model

One of the most widespread misconception regarding the functioning of modern money mechanics is the money multiplier model (Chicks, 1992; Ryan-Collins et al, 2011; McLeay et al., 2014).

The money multiplier is the ratio of the supply of money *(M)* to the monetary base (B). (Moore, 2006). Briefly explaining, this money multiplier model is anchored in the assumption that cash and coins circulate before being deposited within banks. When a deposit is eventually made, banks after keeping a mandatory fraction set by the central bank, which works as a minimum reserve, can use the remaining amount to make loans to the public. Costumers, in their turn, after contracting a loan are expected to spend it into the economy as it circulates before being re-deposited. From every deposit made, as long as the reserve requirement is respected, the remaining money can always be re-lent. This practices represent a cyclical process that continues until the amounts being re-lent and re-deposited become miniscule.

Ryan-Collins et al. (2011) states that many economics textbooks use the multiplier model of banking to explain how the approximately 3% of money that is cash is multiplied up to create the 97% that are simply bank liabilities, promises to pay currency on demand.

The following example, adapted from Jackson and Dyson (2012), helps to better understand the discussed model:

A customer deposits his salary of £1,000 into Bank A. The bank recognizes that, on average, the customer will not need the whole £1,000 returned at the same time, being more likely that he spends smaller amounts a day over the course of a month. Subsequently Bank A keeps a mandatory reserve of the money deposited, for example of 10 per cent, in this case £100, and lends out the other £900 to somebody who needs a loan. Now both the original depositor and the new borrower think they have money in their bank accounts.

The borrower takes the £900 and spends it on a good or a service, and then the seller after receiving his payment, creates a new account on his bank, Bank B, with the transferred money.

The original deposit of £1,000 has turned into total bank deposits of £1,900 comprising £1,000 from the original deposit plus £900 lent to the borrower.

At this point the original £1000 allowed the creation of other £900, the money supply has increased up to £1900.

These £900 are then spent in the economy, and the shop or business that receives that money deposits it back into Bank B. Bank B on its turn, keeps a mandatory reserve of its own £90 and lends out the remaining £810. The described process continues with the £810 being spent and re-deposited in Bank C that keeps a reserve of £81 while re-lending £729, and so on. At each point money is re-lent, the sum balance of all the public's bank accounts increases and new money has been created. Figure 2 illustrates the described process

At each stage the amount of money being lent gets smaller, until after 204 cycles the total balance of bank deposits has grown to £10,000. From the original 1000€ of cash, by repeating this process, the money supply increased to £10,000. Figure 3 illustrates the impact of the reserve ratio on the amount of money created and Figure 4 shows the money multiplier model step-by-step, with the additional lending (and the new money created as a result) shown in black.

According to Jackson and Dyson (2012):

> *"Every time the money is re-deposited at a bank, new bank deposits (liabilities from the bank to the customer making the deposit) are recorded on the bank's balance sheet. This process of re-lending continues, up until the point where mere pennies are being relent (…)You can imagine this model as*

> *a pyramid (…)[figure 3] The cash (created by the central bank) is the base of the pyramid, and depending on the level of the reserve ratio, banks multiply up the total amount of money by re-lending it over and over again to a multiple of this original amount."* (p. 59).

According to Ryan-Collins et al. (2011) and McLeay et al. (2014), the money multiplier model reflects a vast number of misconceptions related with the way the banking system operates.

The Money Multiplier model, among other things, suggests that base money comes into circulation debt free, seeing the central bank as the entity responsible to put money into circulation.

It implies that banks need to wait for someone to make a deposit before starting making loans, suggesting that deposits precede lending and that commercial banks are simply intermediaries with no real control over the money supply.

Within this perspective banks' main role is to take money from savers and lend it to borrowers. The interest received on savings accounts is an incentive to save, a compensation for not spending the money immediately and allowing banks to perform their main activity. Subsequently, banking role is very important for the economy as it ensures that savings are actively being put to use by the rest of the economy rather than lying dormant under people's mattresses.

Another implication of the money multiplier theory is that central banks, as the monopoly supplier of reserves that are demanded by the banking system, can set the quantity as well as the terms on which they are provided, having the ultimate control over the total amount of money in the economy, either by changing reserve ratios or the amount of base money in circulation. By doing so central banks are able to limit the final amount of loans and deposits in circulation. For example, if the reserve ratio is raised to 20%, Bank I will only be able to lend out £800 instead of £900, Bank II £720 instead of £810, and so on.

Finally, within this model, the possibility of growth in the money supply is mathematically limited the reserve ratio and the amount of base money. Exemplifying, with a 10% reserve ratio, there is an increase in the money supply for the first approximately 200 cycles, but after this point there would not be any discernible increase, as the amounts being effectively re-lent are infinitesimal. In the case of a smaller and more realistic reserve ratio, for example of 2%, the multiplier stops having an effect after

around 1,140 cycles and in an economy of millions of people, this number of cycles of re-lending would take a few weeks at most (Ryan-Collins et al., 2011).

To conclude, the three misconceptions explored in the present section, revealed to be of great importance as they show how most of the general public is unaware of the proper functioning of the banking system. As stated by Jackson and Dyson (2012):

> *"The lack of knowledge as to what banks do has severe implications for the state of democracy. After all, how can there be a meaningful democracy without public understanding of such an important issue as what happens to your money when it is deposited in a bank account?"* (p. 136)

2.1.3) Endogenous money theory

The greatest difficulty abandoning the use of the money multiplier theory, is that even if it is not an accurate representation of the way the actual monetary system works, the money-multiplier theory appears to be logical, persuasive, and amply supported by empirical evidence.

According to this theory, the money multiplier (*m)* is the ratio of the supply of money *(M)* to the monetary base *(B)*. The money supply *(M)*, in a simplified version, may be defined as the sum of currency *(*C) plus bank deposits *(D)*. The monetary base *(B)* is defined as the sum of currency *(C)* plus bank reserves *(R)*, both liabilities of a central bank (Moore, 2006).

In other words:

(1) $m = M/B$

(2) $M = C + D$

(3) $B = C + R$

By substitution of equations 2 and 3 into equation 1:

(4) $m = (C + D)/(C + R) = [(C/D) + 1] / [(C/D) + (R/D)]$

Rewriting equation 1, the money supply is a stable "multiple" *(m)* of the monetary base *(B)*:

(5) $M = mB = [(C/D) + 1] / [(C/D) + (R/D)]\ B$

From equation *(5)* the supply of credit money *(M)* appears determined by three main factors (Moore, 2006): the currency- deposit ratio *(C/D)*, determined by the public; the reserve ratio *(R/D)*, determined by the banking system; and the base money *(B)*, determined by the central bank.

The money-multiplier theory concludes that money supply is jointly determined by the behavior of the public, the banking system, and the central bank. As long as these ratios vary within a narrow range, any effect of changes in the ratios on the multiplier can be offset by the central bank's manipulation of the base money. In fact it appears that the money supply is firmly under the exogenous control of the central bank.

Based on the equation, the argument that the money supply is exogenous under the direct control of this entity, appears to be logical, however, in line with Moore (2006), it provides a remarkable illustration of how easily mathematical manipulation leads to the reversal of the "real" direction of causality and incorrect theoretical and policy conclusions.

The money multiplier *(m)* as an identity, it is the ratio of the money supply *(M)* to the base money *(B)*: $m = M/$B. When written*:* $Bm = M$, and by assuming that the base is exogenous, it appears self-evident that exogenous changes in the base "cause" exogenous changes in the money supply: $\Delta Bm \rightarrow \Delta M$.

However as the multiplier is simply an identity it also remains true when inverted, and expressed as: $B = (1/m) M$. The interpretation of this new formulation can with equal logical vigor imply the existence of a "reverse causality." Changes in the money supply cause changes in the base: $\Delta M (1/m) \rightarrow \Delta B$ (Moore, 2006).

In other words, implicit in the money multiplier theory is the assumption that central banks implement policy through exogenous variations in the supply of reserves and by doing so, can exercise a direct influence on the amount of loans and deposits in the banking system, however a true comprehension of the direction of causality between reserves and deposits demands a realistic understanding of commercial bank behavior.

In fact, the true causal relationship actually runs in exactly the opposite direction in accordance with the alternative interpretation of the money multiplier identity: changes in the money supply cause changes in the base.

The banking system creates deposits as they are demanded by the private sector, and the central bank's main task is to guarantee a sufficient supply of reserves for the system as a whole to maintain reserve requirements, if any, associated with those deposits.

It is the amount of deposits that the banking sector can attract that determines the level of reserves not the other way around (Borio and Disyatat, 2009).

The modern process determining the money supply actually works as it follows (Goodhart, 2001):

First, the central bank determines the short-term interest rate in according to a set reaction function it is following.

Second, at the established rates, the private sector determines the volume of borrowing from the banking system that it wants.

Third, banks then adjust their own relative interest rates, marketable assets, and interbank and wholesale borrowing to meet the credit demands. By meeting credit demands choosing how much to lent within the given conditions, commercial banks determine both the money stock and consequent amount of deposits.

Forth, only after the new loans have been created commercial banks start searching for the required reserves, according to the required reserve ratios. The required volume of bank reserves then determines how much the banks need to borrow from, or pay back to, the central bank in order to meet their demand for reserves.

Lastly as any excess demand for reserves above or below their supply will tend to change the level of interests previously set on the first step, the central bank uses open market operations or its standing facilities to satisfy the banks' demand for reserves established under the forth step.

A variety of research supports Goodhart's (2001) explanation regarding the proper functioning of the monetary system. Moore (1988), concluded on his research that instead of the amount of deposits being the reason behind the amount of lending, actually loans are the reason behind deposits. Also, on the beginning of the 90's, Kydland and Prescott (1990), empirically tested if the monetary base increases before banks make loans or afterwards, finding that even though some economists still believe on it, there is no evidence that either the monetary base, banknotes and coins, leads the credit cycle.

King (1994), former Governor of the Bank of England, declared that the Central Bank supplies base money on demand, at its prevailing interest rate, as broad money is created by the banking system. Howells (2005), contributed to this position by confirming on his research the hypothesis that loans cause deposits. More recently, Disyatat (2008; 2010) of the Bank for International Settlement (BIS) published a paper criticizing some policy-induced changes, stating that loans drive deposits, not the opposite. And finally, Constâncio (2011), the Vice-President of the European Central Bank, claimed that the sequence works with banks taking first their credit decisions and then searching for the necessary funding and reserves of central bank money.

In words of McLeay et al. (2014):

> *"(...) reserves are, in normal times, supplied 'on demand' by the Bank (...) to commercial banks in exchange for other assets on their balance sheets. In no way does the aggregate quantity of reserves directly constrain the amount of bank lending or deposit creation. This description of money creation contrasts with the notion that banks can only lend out pre-existing money, outlined in the previous section."* (p. 3)

Under the current monetary system there is no exogenous constraint on the supply of credit except through regulatory capital requirements, which by themselves are very limited accomplishing their role, as it is going to be further explored on the current dissertation. It is an endogenous theory because loans are created, and consequently bank deposits, purely on the basis of commercial banks' own confidence in the capacity of the borrower to repay the loan based on perceived risk-return trade-offs for those loans.

Endogenous money theory sees causality in the banking system beginning with banks lending and creating deposits in the process, increasing the demand for reserves in order to settle payments, which are provided by the central bank on demand. Therefore, within this perspective central banks simply comply with the commercial banking sector's lending decisions.

A direct consequence of the analyzed information, is a clear contradiction of the money multiplier theory, which is outdated and uninformative in terms of analyzing the dynamics of bank lending. Commercial banks, by extending credit to the demanding population, determine most of the money supply. The central bank, on this perspective, provides the necessary reserves to ensure that all payments settle at the end of the day. This information does not imply that there are no limits to money creation, because they

exist, but these limits tend to be self-imposed by the commercial banks rather than a result of oversight or control by the central bank.

2.2) Understanding commercial banks' business model

Acknowledging that commercial banks are the main responsibles for the creation of most money supply, does not imply that they cannot go bust. In fact, one of reasons that banks' confidence may be volatile affecting the availability of credit, is the fact that, despite that ability to create money, banks nevertheless go bust. Consequently, to comprehend the mechanisms of the current monetary system, it becomes essential to understand the basics behind commercial bank's business model.

2.2.1) Banks and profitability

As most private business, banks aim profitability. Traditionally banks profit mostly through lending activities, being the profit the interest charged on the loan, minus any cost. Their unique business model allows them to increase loans without any meaningful increase on costs, permitting them to have a revenue stream that can rise exponentially in stable periods, limited only by the perceived ability of the borrower to repay the loan or by the type of collateral owned by the borrower (Jackson and Dyson, 2012).

Traditionally before conceding new loans, banks would check three factors. The three C's were: credit history, collateral and character of the borrower. A default from a borrower implies a shrinkage of bank's assets without a matching change on the liabilities, decreasing the net worth of the bank and affecting shareholder's equity. For a bank to be profitable and more importantly for a bank to stay solvent loans needed to be repaid (Davidson, 2008).

Today, even if parallel business models emerged as it is going to be explored later, making loans is the main way through which banks can profit.

2.2.2) How do banks go bankrupt?

While reflecting about banks capacity to create money, it is only natural to wonder, if banks can create money, why do they go bust?

The reality is that banks are not invulnerable and within the present section the two main requirements for banks to stay in business are going to be developed.

a) Solvency

To stay in business banks must ensure that their assets, such as loans, are greater than or at least match their liabilities, as deposits for example. If the value of assets falls below their liabilities, they will become insolvent. This means that even if the bank sold all its assets, it would still be unable to repay all its depositors and thus meet its liabilities. Once a bank is insolvent in a balance sheet sense, it is illegal for them to continue trading (Ryan-Collins et al., 2011).

Simply explaining, the difference between assets and liabilities is referred to as shareholder equity and if assets are greater than liabilities shareholder equity is positive and the bank is solvent. On the other hand, if assets are smaller than liabilities, shareholder equity is negative and the bank insolvent.

There is a variety of ways that can lead to a decrease on the value of bank's assets. For example, when borrowers default and fail to repay their loans, or when there is a decrease on the value of a financial instrument such as stock and bonds. If an expressive proportion of assets loses its value or vanishes from the balance sheets, the value of the liabilities can surpass the value of assets and the bank would become insolvent and incapable to repay all of its creditors.

Creating new money would not help on a situation of insolvency as the only way for banks to create money is through making loans or buying assets and in this situation making loans increases the assets and the new deposits the liabilities by practically an equal amount. In other words, creating new loans does not affect the net difference between assets and liabilities. To become solvent again, a bank must find a way of reducing its liabilities, increasing its assets, or both (Ryan-Collins et al., 2011).

b) Liquidity

A liquidity crisis occurs when a commercial bank does not have enough liquid assets, such as cash, to meet its short-term obligations. If for example customers decide to start withdrawing in mass their deposits from a bank, it can rapidly run out cash and/or central bank reserves (Ryan-Collins et al., 2011).

To face a situation like the mentioned, the bank may try to quickly sell off its loans or even be forced to start a fire-sale of all of its assets. Pressured to find resources to satisfy the demands of its clients, normally there is a decrease of the bank assets' price. If the bank is incapable to meet its liabilities or if its assets' prices keep falling, this will eventually lead to insolvency.

This concept is also known as the survival constraint and was first developed by Minsky (1954).

In a liquidity crisis, the ability of banks to create money also does not help to solve the problem, in fact it would make the situation even worse. Every loan creates new bank deposits that would give the borrower the right to withdraw cash or allow him to simply use those deposits to pay away to customers of another bank. This would mean that the bank would need to find even more cash or central bank reserves to settle the transaction with other banks.

Summarizing, when facing either a liquidity or a solvency crisis, the power of banks to create broad money is of no use. Consequently, if mismanaged commercial banks may face the risk of bankruptcy.

2.2.3) Regulation constraining on bank lending

Even if commercial banks' ability to create money does not directly allows them to solve their mismanagement problems, it does not completely attenuates the tremendous capacity of those agents to influence the overall economy in its favor.

To attenuate and control commercial bank's fundamental role that is the power to create broad money and influence the money supply, the governments and central banks have three main types of constraints that aim to limit bank lending activities and

consequent influence over the monetary system. Those restrains are reserve ratios (liquidity ratios), capital ratios and policy rates (Ryan-Collins et al., 2011; McLeay et al., 2014).

a) Capital Ratios

As, already mentioned within the current essay, the only constraint on credit is capital (Disyatat, 2010). Capital, as wealth in the form of money or other assets, can be derived from retained profits or money raised from investors, including the owners of the bank: the shareholders. Just like deposits or credits, capital is an accounting entry, but in contrast to deposits it cannot be withdrawn.

Capital reserves requirements represent a set of rules referring to the asset side of a bank's balance sheet and act like a hard constraint on asset expansion, being used to limit commercial banks' lending capacity. Capital requirements are set in accordance with the Basel Capital Accords (Ryan-Collins et al., 2011).

As stated by the Bank for International Settlements (BIS website), this accords were established by the Basel Committee on Banking Supervision (BCBS) consisted of representatives from central banks and regulatory authorities of the G-10 countries plus Luxembourg and Spain, with the objective to improve banking supervision and regulation worldwide.

Capital requirements, as explained by Ryan-Collins et al. (2011), have two main objectives:

First, by making banks hold a certain amount of capital they should be able to survive if significant number of their assets become non-performing, as on the case of loan defaults. By remaining solvent banks can easily retain the confidence of other banks and their clients. Consequently solvent banks are expected to be less likely to suffer a liquidity crisis, as they can more easily access reserves on the interbank lending market, and clients are less likely to rush to withdraw their deposits.

Second, capital ratios are supposed to act as a constraint on bank's lending activity. This is a key aspect of the Basel Capital Accords, which stipulate that the ratio of a bank's capital to its assets must not fall below some pre-determined amount.

Consequently, for banks to be able to lend they must have a certain amount of capital every time they make a loan

b) Reserve ratios

Another type of constraints used to limit bank lending are reserve ratios. Reserve ratios are a policy implemented by the central bank which requires that commercial banks hold a percentage of base money against its deposits. Reserve ratios (or liquidity ratios), refer to the liabilities side of bank's balance sheet. Based on the reserve rations, reserve requirements are set, representing the minimum amount of reserves a credit institution is required to hold against its deposits. For example, a 10% reserve ratio states that for every $100 of customer deposits a bank must have $10 of base money (ECB, 2011).

Pure reserve ratios include only base money. A liquidity ratio also includes highly-liquid assets, such as government bonds, instead of cash or central bank reserves, as they can easily be traded for base money.

By forcing banks to hold a certain percentage of central bank reserves, which can only be created by the central bank, it is possible to the central bank to restrict the amount of broad money, or bank deposits in a certain economy (ECB, 2011).

c) Policy rates

A third constraint on bank lending activity are policy rates. Policy rates are a set of interest rates that commercial banks have to pay to have access central bank reserves. This instrument has a direct effect on the cost and consequently quantity of borrowing by households and companies, by influencing the loan rates charged by banks (ECB, 2011; McLeay et al., 2014).

To implement the target monetary policy, the central bank sets short-term interest rates, by controlling the price paid on central bank reserves. As commercial banks need to borrow reserves and cash to respond to liquidity and regulatory demands, the price to access reserves has a meaningful impact on other interest rates in the economy such as the interbank market rate. This rate represents the base price on which commercial banks lend and borrow reserves amongst themselves. A central bank by influencing the rate at

which banks are willing to lend from each other on money markets, ends up affecting different markets and maturities, ultimately including the interest rates that banks charge borrowers for loans and offer savers for deposits (ECB, 2011).

Through this process, by influencing the price of credit, monetary policy theoretically affects the demand for loans and the level of broad money creation.

2.2.4) Why are the measures used to constrain bank lending and subsequent money creation ineffective?

A clear message from the former the 2007/2008 financial crisis and consequent world reception, also known, in line with the United Nations (2015), as the Great Recession, is that the former regulatory constraints are not enough to properly control commercial banks' lending activities. The current section is going to approach some of the reasons limiting these constraints effectiveness.

a) The possibility of securitization

As seen, capital requirements main goal is to limit lending capacity by stipulating the limit ratio of bank's capital to its assets. The problem is that there are certain conditions that jeopardize the ability of this tool to fulfill its objective.

First of all, the Basel Accords, issued by the Basel Committee on Banking Supervision (BCBS), do not issue binding regulation. Instead it functions as an informal forum in which policy solutions and standards are developed. The BCBS goal is to encourage convergence towards common approaches and standards and recommendations are chosen to be implemented by each member and then enforced through national laws and regulations (Kerwer, 2005).

The direct implication is that if a country is not under the Basel Accords, there is a possibility for the capital requirements not to even exist in the first place. Either way this scenario is highly unlikely on a modern economy.

A second notion related with capital reserves is that it is very simple for banks to increase their capital. As long as loans are repaid, bank's profitability can be channeled

to increase capital, and consequently increase lending activities, which once again if repaid allow the cycle to continue. Another way for banks to increase their amount of capital is by issuing new shares, which during a boom period does not represent a challenge as banks' profitability tends to be high, just as its dividends (Binswanger, 2009). In words of Disyatat (2010):

> "*An adequately capitalized banking system can always fulfill the demand for loans if it wishes to*" (p. 2)

The consequence is that capital reserves by themselves are not very effective restraining bank's lending, they work simply by slowing down the process, as banks find "natural" ways to increase their capital. In fact, capital reserves main purpose is to stimulate confidence in the banking sector, as it works a buffer for depositors and other bank creditors when a bank's assets fall in value, by making shareholders take the first hit rather than depositors losing money (Ryan-Collins et al., 2011).

It may be said that even if not perfect, capital requirements still have an impact and that any of the previous methods is a direct way to surpass capital requirements. The problem is that a parallel model also emerged that not only allows banks to diversify their profitability mechanisms but also to surpass capital requirements (Davidson, 2008; Ryan-Collins et al., 2011). The process is known as securitization and represents the process through which certain types of assets are pooled together so that they can be repackaged into interest-bearing securities. The interest and principal payments from the assets are passed through to the purchasers of the securities (Jobst, 2008).

Some banks instead of receiving interests over the lifetime of a loan, begun consolidating multiple loans together, and selling them to investors. On this particular case, banks receive an upfront payment, while investors obtain a stream of revenue over the life of the financial instrument. Instead of the traditional view of interest as Bank profits, bank's profitability comes from a fee for arranging the loans.

In its most basic form, the process involves two steps (see Figure 5). In step one, a company with loans or other income-producing assets, called the originator, identifies the assets it wants to remove from its balance sheet and pools them into a reference portfolio, which is then sold to an issuer, such as a special purpose vehicle (SPV). An SPV is an entity usually set up by a financial institution owned by the originator or by an investment bank, specifically to purchase the assets and realize their off-balance-sheet

treatment for legal and accounting purposes. In step two, the issuer finances the acquisition of the pooled assets by issuing tradable, interest-bearing securities that are sold to capital market investors. The investors receive fixed or floating rate payments from a trustee account funded by the cash flows generated by the reference portfolio. In most cases, the originator services the loans in the portfolio, collects payments from the original borrowers, and passes directly to the special purpose vehicle. When the SPV is structured as the trustee, it deals as the gate-keeper of the assets that are being held in the issuer. Even though the trustee is part of the SPV, which is typically wholly owned by the Originator, the trustee has a legal duty to protect the assets and those who own the assets, typically the investors (Jobst, 2008).

Any type of asset with a stable cash flow can in principle be structured into a reference portfolio to be securitized. Securities can be by mortgages, by corporate and sovereign loans, consumer credit, project finance, lease/trade receivables, individualized lending agreements, etc... The generic name for such instruments is asset-backed securities (ABS) or collateralized debt obligation (CDO), which includes a wider and more diverse range of assets then the former. However, securitization transactions backed by mortgage loans are called mortgage-backed securities (MBS) (Jobst, 2008).

Banks by moving assets off their balance sheets, are able not only able to pass the risk of those asset's default to third parties, as loan originators retain no residual risk for the loans they make, but are also able to avoid the need to keep a capital reserve for loans that they no longer possess. Consequently, the part of capital reserved to cover potential losses of the former loans can now be used to create new ones. With this process commercial banks found a way to go around the capital requirements and keep lending, (Calvin, 1998; Davidson, 2008; Jobst, 2008).

As stated by the Fed:

> *"In the case of regulated institutions, i.e., banks and thrifts, the selling of assets in such a fashion as to meet the regulatory requirements for removal from the balance sheet might mean substantial cost savings by having avoided capital maintenance requirements, reserve requirements (...)"* (p.3)

Also, as mentioned by the Bank of Canada (2009):

> *"With securitization, the supply of credit expands because sponsoring financial entities do not need to hold capital (or reserves in the case of non-*

> *bank entities) against potential losses on loans that become securitized. Instead, they can assign this capital (reserves) to other productive uses, such as new loans."* (p. 48)

Summarizing, if a bank uses its tools effectively, it will face very little, if any, effect of the capital restrictions on its lending activities.

b) "Too-big-to-fail"

The great problem with the reserve ratio restraint is that its concept is based on the money multiplier model, which approaches banks as entities whose lending activities are a consequence of the quantity of the base money held in reserve. As previously explained by the endogenous money theory, in reality banks extend credit, creating deposits in the process, and looking for the reserves later.

When in need of reserves, either to set the minimum requirement or to pay other institutions, banks have a variety of ways to have access to them, from borrowing on the interbank market, to the use of standing facilities to borrow directly from the central bank (Gray, 2008). In fact, the ECB (2011) asserts that one of the main roles of the central bank is to ensure an orderly functioning of the money market and to help credit institutions to meet their liquidity needs and to avoid any disturbances on the payment system.Central banks guarantee to provide credit at times of crisis when no-one else will, this function is known as "Lender of Last Resort".

Nevertheless, in a hypothetic situation, if a central bank would refuse to supply reserves on demand and the commercial bank could not find any in the interbank market, this situation could lead to a liquidity crisis, as the bank would not be able to settle payments by the end of the day. In extreme cases, this event could even cause a solvency crisis and bankruptcy.

Within banks of smaller dimension, this event does not have a great impact in the general economy. However, the greater the bank, the greater the degree of connectedness with the banking system and the greater number of institutions that may fail as a consequence of its bankruptcy. By owing other banks considerable amounts of money, when a bank fails to pay back its loans, other banks may have troubles settling their own liabilities, initiating a domino effect (Bernanke, 2010).

A solvency issue at a big bank may imply creditors to lose a proportion of their money or even cause a cascade of bankruptcies throughout the entire banking system, even if not as a direct consequence of the bankruptcy, by causing depositors panic and runs to other banks. The failure of a large bank negatively affects the economy in general. A bankruptcy by disturbing the payment and the banking system, ends up disturbing the flow of credit to the general economy and the activities of the non-banking sector. The former scenario can lead to serious problems within the economy as a large number of businesses rely on banks not only to provide most of the needed funds for investment and growth, but also to solve some operational liquidity needs (Shull, 2010).

Furthermore, based on the method of destruction of money described by McLeay et al. (2014), if a large bank controls a large proportion of the customers' deposits in a banking sector, its failure can lead to a significant shrinkage of the money supply, as a part of the deposits would not be repaid to bank's customers, and in this way getting out of circulation and ceasing to exist. As a bank fails to repay its liabilities, the amount of deposits that are not paid back to their owners stop circulating in the economy, shrinking the money supply. Depending on the amount of lost deposits, the shrinkage of the money supply can lead to bankruptcies, unemployment and even start a recession (Fisher, 1933).

In line with what was mentioned by Bernanke (2010), Shull (2010) and McLeay et al. (2014), to avoid the insolvency and bankruptcy of a too-big-to-fail bank, and any eventual consequence that may risk financial and economic stability, it becomes wiser, in first place, for a central bank to deliver reserves on demand, and second, for a government to bailout the insolvent bank.

If that wasn't already enough, something called deposit insurance almost automatically forces a government to bailout any insolvent bank of bigger dimensions.

To avoid bank runs and consequent disturbances on the banking system, governments created deposit insurances. Nowadays most governments guarantee that if a bank fails, the customers of that bank will be able to claim a certain percentage or up to a determined amount of their bank deposits. The idea is that costumer by knowing that they are "protected", become more reluctant attempting to withdraw their deposits from banks that are thought to be insolvent or experiencing financial difficulty. Even attenuating depositors' panic in case of a bank insolvency, deposit insurance end up empowering the concept of "too big to fail" even further, as only focusing on the direct costs associated with the reimbursement of the customers of a bankrupt bank, without

taking in account any of the previous mentioned consequences, bankruptcies become highly more costly than bailouts (Demirguc-Kunt and Detragiache, 2002, Jackson and Dyson, 2012).

Summarizing, the threat of bankruptcies of too-big-to-fail banks not only puts at risk the proper functioning of the payment and banking system, but may also lead to colossal expenses by the government and ultimately the collapse of the financial and economic system. The direct consequence is necessity for both the government and the central bank to avoid liquidity and a solvency crisis at commercial banks of greater dimensions almost at all cost. The end result is that for both entities to ensure an orderly functioning of the banking system, they become forced to help these credit institutions to meet their liquidity needs. Any shortage on reserves from a large commercial bank will almost always be supplied by the central bank. By doing so the role of minimum reserves as lending constraints practically disappears.

c) Monetary policy focus on price stability

The core goal of monetary policy is to maintain price stability. In practical terms this represents the aim to control inflation and to keep it at a target level of 2% a year (Chicks, 1992; ECB, 2011). The main way to achieve price stability is by manipulating short term policy rates at which banks can have access to central bank reserves. By changing the rate of interest through which commercial banks can directly obtain reserves, the central bank indirectly affects the market rate of interest on the interbank market and the price rate charged to the public, ultimately influencing developments in economic variables such as output and prices (ECB, 2011; Mukherjee and Bhattacharya, 2011).

Central banks by setting the direction of their monetary policies and by targeting the level of money market interest rates required to tame the current level of inflation and maintain price stability, will be persuaded to supply reserves to commercial banks as demanded to avoid spikes in market interest rates. Any excess demand for reserves above or below their supply will change the level of interests, previously set by the monetary policy. If the demand is above the supply it will bid up the price of reserves, and if it is below it will push down the price. Aiming to maintain the targeted level, the central bank will be forced to increase or reduce the amount of reserves in circulation, to bring the

interest rate back to the aimed level. Acting as such, the central bank fails to constrain bank lending by implementing reserve ratios, as commercial banks can (almost) always get access to reserves (Chicks, 1992).

A second consequence of the former monetary policy, the focus on targeted interest rates as the main tools to fight inflation and achieve price stability, ends up constraining their use as instruments to control bank lending directly. From the moment a price stability policy is implemented, the stimuli to change interest rate level it is not the quantity of lending or the amount of money in circulation, but the level of inflation. In fact the tools used to implement monetary policy were not design in order to achieve any predetermined level of monetary base, they were designed towards making the central bank's chosen key short-term rate effective in determining the set of other shorter-term market rates (Goodhart, 2001).

This information does not mean that interest rates do not affect the demand for loans and consequently the quantity of loans made, because they do. The reality is that central banks have the capacity to make bank rates so high that would almost completely asphyxiate commercial bank's lending activities. It could make rates so unattractive that no one would be willing to get a loan. In others words, central banks, theoretically, have the power to constraint the supply of loans.

However, central banks, given the current focus of monetary policy tools on price stability, have relatively little direct control over the total amount of commercial bank money, accommodating whatever new level of reserves is required by the system.

In summary, when price stability is a priority, central banks become required to supply reserves on demand to avoid spikes on interest rates in order to maintain the target rate at the stipulated level. Second, within this priority, interest rates stop being tools used to control bank lending, answering instead to the level of inflation.

2.2.5) How did we get here? A brief explanation

a) Moneyless economic models

Today, even considering all the subjects explored within the current essay and specially after understanding them, it is still extremely difficult, due to its complex nature, to define and, particularly, to quantify money. (Werner, 2012).

Approximately until the mid-80s equations (1) or (2) were not only the widely accepted bridge linking the tangible "real" economy and the financial/monetary sectors, but also the representation and expression of the demand for money.

(1) $M\,V = P\,Y$

(2) $m + v = p + y$

Whereby M stands for the money supply, V represents the velocity of money during a certain period), P the appropriate average price level and Y symbolizes real GDP. (Werner, 2012).

However, that bridge collapsed as economist were not able explain the widespread and growing empirical observations that velocity had become unreliable, declining significantly as the money demand function was unstable, as it challenged the theory supporting the identity, which expressed the assumption of a stable income velocity.

This empirical failure became a major obstacle to all the other schools of thought which had previously relied on the quantity equation as a foundations to its theories. The incapacity to empirically define money without much ambiguity has been one of the flaws of the macroeconomic models prevalent until practically today. This inability to define money, was the main reason leading to adoption of "an alternative paradigm" in the way economic models were built.

Due to the difficulty of handling money, moneyless models, based on the empirically unsupported premise that money (and banks) did not matter, became truly appealing to economists, offering an escape route from an apparently intractable problem and driving a wedge between the research agendas of monetary and macroeconomists on the one hand, and banking and finance researchers on the other (Werner, 2012).

In other words, a considerable number of research and frameworks used by governments and central banks to manage the monetary system, by ignoring the role of money and finance within their models, became incomplete and inefficient tools to properly explain and help these institutions fulfilling their governing roles.

b) Lobbying and deregulation

Independently from the details leading to the to the sudden devastating collapse of US stock market prices on the Black Tuesday, October 29, 1929, the world, dove into the longest, deepest, and most widespread depression of the 20th century (Duhigg, 2008).

Keynes (1936) blamed the influence of flawed classical models of economics in political decision making, Monetarists as Friedman argued that the Great Depression was mainly caused by monetary contraction which was a consequence of poor policy-making decisions by the American Federal Reserve System (Bernanke, 2000). The Austrian school of Economics also blamed the Federal Reserve, but in opposition to the monetarists, they argued that the key cause of the depression was the expansion of the money supply in the 1920s that led to an unsustainable credit-driven boom (Rothbard, 2000).

Independently from the origin of the Great Depression, one of the consequences of was the creation of a strict set of regulation limiting commercial and investment bank activities, such as the Glass-Steagall Act by the United States, which banned commercial banks from underwriting securities and forced banks to choose between being commercial banks, that held deposits and made loans, and investment banks that conducted securities transactions. The aim of this particular act was, in words of Crawford (2011) to limit the creation of financial conglomerates which would become too-big-to-fail.

However, the lobbying efforts from the commercial and investment banks to loosen these regulation increased significantly in the 1970s and the 1980s, as numerous congressional bills to repeal the Glass-Steagall Act were introduced.

As the events from the Great Depression started fading from the rulers' and public's memory, on the period from the early 1970s until very recently, there has been a gradual deregulation of banking and credit both on an international and national scale, as free-market-oriented governments such as those of Margaret Thatcher and Ronald Reagan in the UK and USA, respectively, influenced by neoclassical free-market economics, began to further dismantle State's controls on bank credit.

In 1999, Senator Byron Dorgan, just before the repeal of the Glass-Steagall Act and as proclaiming a divine prophecy, warned that deregulation of the banking sector

could threaten the integrity of the United States financial system as he stated (Crawford, 2011):

> *"I think we will look back in 10 years' time and say we shouldn't have done this, but we did because we forgot the lessons of the past and that what was true in the 1930s is true in 2010. I wasn't around during the 1930s or the debate over Glass-Steagall... We have now decided in the name of modernization to forget the lessons of the past of safety and soundness."* (p. 129)

Also Senator Wellstone, as described by Crawford (2011), implored:

> *"I rise in strong opposition to S. 900, the Financial Services Modernization Act of 1999. S. 900 would aggravate a trend toward economic concentration that endangers not only our economy, but also our democracy. S. 900 would make it easier for banks, securities firms and insurance companies to merge into gigantic new conglomerates that would dominate the U. S. financial industry and the U. S. economy... This is the wrong kind of modernization because it fails to put in place adequate regulatory safeguards for these new financial giants, the failure of which could jeopardize the entire economy. It's the wrong kind of modernization because taxpayers could be stuck with the bill if these conglomerates become too big to fail."*(p. 130)

In 2007, the global financial crisis began. The underlying issue that can be understood from this brief analysis, is that successive governments, due to successive lobbing efforts from commercial banks, have been dismantling the regulation created to control such institutions and to protect such an important resource that is the power to freely create new money.

Chapter analysis

In the context of the present chapter, something seems very clear, in the modern society there is a lack of knowledge related with the way the monetary system functions.

Within the modern monetary system, most official forms of money are created by central and commercial banks, however, against orthodox theory, central banks do not have the ultimate control over the monetary system and commercial banks are not simple intermediaries between savers and borrowers. In reality, commercial banks through their

lending activities, are themselves responsible for the creation and destruction of most money within a monetary system.

This misconception regarding the modern monetary system, is simply one among many others, which in addition to a gap between the research agendas of monetary and macroeconomists on the one hand, and banking and finance researchers on the other, is are some of the key reasons behind spread use of incomplete and ineffective economic theories used by governing entities to manage the economy.

Furthermore, instead of have been developing stronger and more efficient tools to keep up with the financial innovation of financial markets, successive governments, ignoring important lessons from historical events, have been dismantling the regulatory structure created to some of the most relevant players of this market. The consequence is the appearance financial conglomerates that became too-big-to-fail and which bankruptcy may risk the collapse of the entire system, forcing governments to intervene and support commercial banks in case of mismanagement.

Given central banks' and governments' current choice of political and monetary policy tools, these entities have relatively little direct control over the commercial banks' activities, and therefore over the amount of money in the economy as a whole. The lack of effective regulatory instruments, gave the control of a fundamental role within a modern economy, the power to create money, to private, profit seeking entities.

Ultimately, and focusing on the aim of the current dissertation - understanding why the population uses money - after analyzing the present chapter a conclusion can be reached: people use money as a consequence of the way money itself is created.

For each new euro, dollar, pound of freshly created money by commercial banks, an equal amount of debt is created, therefore for every cent of commercial bank money there is always someone who owes that amount to the bank, its creditor.

Even the small amount of cash, which is created by central banks and thought to be "debt-free", are put in circulation by commercial banks and can only be reached through the exchange of bank deposits, within a bank account, for it.

Bank deposits, or commercial bank money, are a pre-requisite to access cash and a form of debt owed to commercial banks, consequently for money to circulate someone must be in debt.

On the same way that States by taxing the public create a demand for money by creating an obligation to settle with this entity, the process through which money is created generates the obligation for the population to settle with its creditor. Therefore, the way money itself its reaches the public becomes one of the reasons why people use money, to try to extinguish their obligations with the banks, as there for there to be money there must always be someone in debt, consequently there is always someone in need of having money to settle.

Chapter 3: Consequences of the current monetary system

The present section deals with some of the consequences of the deregulatory trends supported by many governments and of the influence of commercial banks in the modern economic system, in order to better understand if is there any extra factor boosting the necessity for people to use money.

3.1) The impact of credit allocation

To properly understand the impact of increased credit within an economy, it becomes fundamental to understand the different implications of credit being used to develop productive business or industry, versus its impact when used to buy assets or financial instruments.

Money creation for investment in productive capacity, for a business investing to increase its output, for example, it does not only increases the purchasing power in the economy but also increases the quantity of goods produced, in other words, it increases the productive capacity of the economy.

For example, investment which include money spent on research and development, can lead to the discovery of new technology, inventions, and production techniques that increase the potential output of the economy beyond its current level. Credit creation for productive purposes usually results in the increasing of the quantity of goods and services produced in the economy, without bidding up the price of any inputs. As a result it should increase output without increasing inflation. (Werner, 2005)

On the other hand, when credit is used for the purchase of pre-existing assets such as houses or shares, it usually leads to an increase in the price of the asset purchased as, unlike when credit is created for investment, credit creation for asset purchases does not increase the quantity of goods produced in an economy, it only increases the availability of money to buy it.

For example, mortgage lending creates new money and allocates it into the property market, increasing the demand for houses. With no change in the quantity of houses available to purchase, the most likely effect will be to increase house prices.

In response to the increased house prices it could be argued that an increase in the price of an asset acts as a signal to developers to build more houses, as increasing house prices lead to an increase in the number of houses being built, increasing their supply and so leading to a fall in their price. However, this argument is not accurate due to two main reasons. First, an increase in house prices also tends to increase the price of land. And producers would see their revenues rise they also see their costs rise and so rising prices do not turn into increased profit margins. Second, rising prices attract speculators, which as we are going to further explore, will drive house price appreciation. The same effect applies for share markets. (Werner, 2005; Keen, 2012)

The increasing money supply, by increasing the availability of money, allows the population to increase consumption. With demand increase, business may increase their profits either by increasing production, or by increasing prices. On those products which the demand is faster than the ability to supply it, by increasing production, the increase of prices is a natural consequence. Assets as houses and specially land, are an example of assets where that can be applied. The rising of house and property prices, also has interesting consequence on consumption, it increases wealth and the consequently the ability of homeowners to borrow and willingness of banks to lend. More lending increases the money supply and, once again, the amount of money available to spend on consumer goods, houses or financial assets.

It is important to note that the direction of bank lending is not determined by the market, commercial banks choose to whom, how much to lend. The allocation of new lending is usually determined by the likelihood of repayment, and the ability to collateralize loans to ensure that non-repayment does not result in a loss to the bank.

Consequently, loans tend to be disproportionately allocated towards the financial and property markets as a result of banks' preference for lending against collateral, with the vast majority going towards mortgages, real estate companies, and financial intermediation, as not only those loans are collateralized, but even if assets prices increases it reduces banks' risks. As long as the price of the asset of collateralized loan is increasing, the bank doesn't even need to worry about the borrower's ability to repay, as it can repossess the asset and recover the amount originally lent (Jackson and Dyson, 2012).

The key point being, banks have incentives to create credit that finances trading in existing assets, real or financial, which do not contribute to GDP, but that instead is strongly associated to unsustainable asset inflation.

3.2) Credit booms, financial crisis and dependence on credit.

The Debt Deflation Theory of Great Depressions, by Irving Fisher (1933) identifies as the causes of all great depressions over-indebtedness and the deflation that follows it soon after.

Hyman Minsky (1992) on his financial instability hypothesis explores one of the consequences of the current system, explaining how credit bubbles form, how they burst and what the resulting economic effects of these phenomena are.

Under this theory, the modern capitalist economy has inherent instability associated to it. Cycles characterized by booms and growth, depressions and crisis, become natural elements of the present system. Minsky (1992) presents the concept of destabilizing stability, defending that periods of stability through history have been leading to depressions and debt deflations.

To illustrate the process through which these events are developed Minsky (1992) creates a scenario of an economy just emerging from a long recession. Due to the strict conditions imposed by the former period of austerity, firms and individuals tend to have low levels of debt relative to their equity as individuals and banks are conservative regarding their borrowing and lending activities. The result is a great majority of low-risk investments and a great number of economic agents being expected to fulfill their financial obligations through their income alone. As the recession ends and a new period

of economic growth begins, associated to increased profits and higher employment, the former conditions have a positive impact on the level of confidence attached to the economy culminating in a higher willingness for banks to lend and firms to borrow.

As confidence slowly grows, some preventive measures established during the previous crisis start to be revised downwards combined with a change of acceptable debt structures and an increase on asset prices. As firms increase their borrowing, some stop being able to fulfil their debt obligations through their income alone and consequently start to roll over their debts as their mature emerges. Still, as asset prices start rising and relative low interest rates, some economic agents start profiting by speculating on the price of assets. Economic growth, just as the level of investments, employment and asset prices, continue to rise, however this turn it is financed by an acceleration of debt (Minsky, 1992).

Within this time line, banks start extending credit to those that cannot afford it by accepting assets as collateral. Due to the continue increase of the value of assets, in case of default banks can still sell it for a profit.

The ability to profit from speculating on asset prices leads to the emergence of units which do not earn sufficient income to pay either the interest or the principle on their debts, becoming dependent on capital gains. To pay their debts these units must either continually access to credit or sell their assets. These agents represent the highest level of fragility of an economic system.

As interest rates start rising, either because of market forces or because of the central bank is trying to prevent the economy from overheating, the number of fragile units increases as credit becomes more expensive. With increasing interest rates, there's a decrease of new borrowing resulting on a reduction of the asset purchases. The still growing supply of assets when facing the decreased demand, is forced to start reducing the price of the assets being sold.

Consequently, most fragile agents stop being able to cover their debts and the bubble bursts. The decrease of loans being paid and the reducing assets' price, culminates on the fading of optimism, higher risk aversion, and finally banks stop lending. The formerly growing money supply as product of the increasing credit availability, starts shrinking as lending stops (Minsky, 1992).

According to Fisher, after the burst of a bubble the state of over-indebtedness will tend to lead to:

> *"(1) Debt liquidation* [which] *leads to distress selling and to (2) Contraction of deposit currency, as bank loans are paid off, and to a slowing down of velocity of circulation. This contraction of deposits and of their velocity, precipitated by distress selling, causes (3)A fall in the level of prices,,(…) (4)A still greater fall in the net worths of business, precipitating bankruptcies and (5) A like fall in profits, which in a "capitalistic," that is, a private-profit society, leads the concerns which are running at a loss to make (6) A reduction in output, in trade and in employment of labor. These losses, bankruptcies and unemployment, lead to (7) pessimism and loss of confidence, which in turn lead to(8)Hoarding and slowing down still more the velocity of circulation. (p.342)*

This phenomenon is called a debt deflation and explains that restrictions in the money supply, as a consequence of lower levels of credit, usually due to the loss of confidence by the creditors, make the economy to slow down as people repay their debt at a faster rate than new loans are contracted. The consequence is that money is being destroyed at a faster rate than it is being created, the result is the shrinkage of the money supply and the rise of deflationary pressures, increasing the real value of debt and making it more difficult for indebted firms to repay their loans.

Without enough money in circulation to sustain the previous level of economic activity, firms' revenues drop as consumption falls and firms need to restructure to avoid bankruptcy. This leads to lower wages, higher levels of unemployment and still further bankruptcies and defaults on debt (Fisher, 1933).

This downward spiral continues, as a recession emerges, associated to a period of great austerity, due to the bankruptcies, low economic growth and conservative bank lending. The new measures force firms to deleverage and lower their debt to equity, as to survive they need be able to fulfil their financial obligations.

Slowly, after a period of great restructuration, firms adapt, the economy stabilizes and without people even realizing, banks regain trust and it is stage one once again, and the cycle restarts.

The first consequence of Fisher's (1933) and Minsky's (1992) research is the correlation between uncontrolled credit booms and financial crisis. A large number of studies confirm these theories. Schularick and Taylor (2009) by analyzing data from 14

advanced countries, between 1870 and 2008, concluded that financial crises throughout modern history can be viewed as credit booms gone wrong. Turner (2012) argues that the undesirable economic outcomes are systematically worse the larger has been the prior credit boom. In fact the financial crisis of 2007-2008 occurred because governments failed to constrain commercial banks credit and money creation activities. Turner (2012) even states that private credit is the only useful and reliable predictive factor of a financial crisis.

To understand how these events are not sporadic situations, it is important to consider Reinhart and Rogoff (2009) and Laeven and Valencia (2012). The first research concluded that in the UK alone, since 1945, there has been a banking crisis on average once every 15 years. Laeven and Valencia (2012), on a separate research to the International Monetary Fund, showed that between 1970 and 2011 there were 147 banking crisis worldwide.

A second consequence is the recognition of commercial bank's confidence as the main determinant of broad money creation and consequently of the monetary base. The current research, shows that in the modern system the amount of money in circulation is not actively determined by regulation, capital or reserve ratios, the government or central banks, but largely by the confidence of the banks at any particular period in time. When commercial banks are confident, they expand credit and create new money. If they are fearful, lending and credit becomes limited strangling the creation of new broad money.

Thirdly**,** nowadays the demand for credit is not only driven as a result of people wanting to borrow, but also by the necessity of credit for the economy to function.

Debt deflation states that as new money is created and the money supply grows, the level of economic activity adapts to the increased availability of money. Any further restriction in the money supply, for example as a consequence of lower levels of credit, make the economy to slow down as people repay their debt at a faster rate than new loans are contracted. When that happens and more money is destroyed than the one that is created, the money supply shrinks and if the situation continues wages will drop, unemployment will rise, bankruptcies increase and further defaults on debt, which may even lead to a recession.

The consequence of the process through which money is created and destroyed is that, for the economy to work, people need to constantly get in debt at least at the same

rate that money is being destroyed. Only by doing so can the level of the money supply be maintained and a debt deflation avoided (Fisher, 1933).

Taking in consideration the explored literature not only it becomes clear and important to conclude that the modern capitalist economy has inherent instability associated to it and that both commercial banks and governments are to blame as credit booms lead to cyclical financial crisis that naturally emerge from uncontrolled bank lending.

Understanding how money is created and destroyed, and how debt deflation works, enables to comprehend how the current demand for credit in the modern economy is not only driven by people wanting to borrow, but it is mainly a consequence of the enormous addiction of the current economy on credit. In order for the system to orderly function, debt and credit are required either for the population to have access to cash and banknotes, or to maintain the current level of the money supply.

3.3) Banks' benefits from the dependency

One of the direct consequences of the current dependence of the modern economy on bank's economic role, is the constant transfer of wealth from the rest of the economy to the banking sector through the payment of interests. To have a notion of how much money is transferred annually to banks, Jackson and Dyson (2012) make the following illustration:

> "*In the UK the money supply currently stands at approximately £2 trillion. Assuming an average interest rate of 8% on bank loans, in order to keep the money supply at a constant level requires the non-bank sector to transfer £160 billion a year to the banking sector in interest charges."*(p. 127).

In the same line of reasoning, when loans are repaid the principal is destroyed, removing money from the economy, and the interest on the loan becomes bank's profit. A percentage of this interest is recycled into circulation in the form of staff payments and dividends to shareholders, and the remaining is usually retained by the bank to increase its capital. Subsequently, every time money is destroyed and capital is retained, banks remove purchasing power from the economy as it accumulates wealth. By reducing the amount of money available to consume the additional goods that their clients originally

borrowed to produce, there is a loss of possible income to firms as a part of their payments to banks will not flow back into circulation (Binswanger, 2009).

A second consequence of the current system related to the payment of interest is the banking sector contribution to inequality within the non-banking sector. There is a systemic need for a group to be in debt for others to have a positive bank balance.

According to Jackson and Dyson (2012), as it can be seen on Figure 6, in the British economy the burden of interest payments as a percentage of household income disproportionately falls on those households in the lower deciles, while the benefits of these interests, in the form of bank dividends and staff pay, disproportionately benefits the top decile of income earners. In other words, as stated by Kennedy (1995):

"(…)within our monetary system we allow the operation of a hidden redistribution mechanism which constantly shuffles money from those who have less money than they need to those who have more money than they need." (p. 10).

This phenomenon represents a normal trend on current developed economies.

3.4) The hard evidence

The financial crisis of 2007–2008, known as the Global Financial Crisis, in words of Crotty (2009), is considered the worst financial crisis since the Great Depression. Just as stock markets plumed, large financial institutions threatened to bankrupt and collapse the global economy. By stepping in and bailing out those organizations governments worldwide were able to prevent a greater calamity, however many smaller firms went out of business, unemployment rose, consumer wealth declined just as the overall economic activity. The end result, a global recession (Verick & Islam, 2010).

Looking at the particular case of the US economy, where the financial crisis started, prior to the crisis, within a period of 7 years, commercial banks almost doubled their amount of lending as regulatory framework worldwide simply did not keep pace with financial innovation (Figure 7). More particularly, focusing on household credit as percentage of GDP, data indicates a rise of more than 50%, from 48%t of GDP in 1980 to 99% t in 2007 (Crotty, 2009; Taylor, 2009; Greenwood and Scharfstein, 2013).

The repealing of regulation along years anticipating the crisis reduced the separation between commercial and investment banks and not only giant financial conglomerates were created as a consequence, but also commercial banks discovered a means to circumvent the capital regulations allowing them to preserve their capital adequacy and maintain liquidity whilst continuing to expand credit creation (Crawford, 2011; Ryan-Collins et al., 2011).

The excessive credit being lent to unproductive area, was responsible for the creation of a housing bubble which became one of the main reasons for the beginning of the crisis. Within the United States, since 1998, home prices increased over 132% (Holt, 2009).

As asset prices rose, investors started speculating on those same prices. A good example of the type of speculation in place, which reflects the level of fragility of the regulatory framework could be specially found within the derivatives market, as investors were not only allowed to hedge or speculate against particular credit risks without necessarily owning the underlying debt instrument, but also allowing agents selling financial instruments to bet against their own products. These kind of predatorial acts of unscrupulous lenders, attracting borrowers to enter into unsafe or unsound secured loans for inappropriate purposes, associated with doubtful ratings from the rating agencies and lack of regulation, allowed banks and investment banks to contaminate financial markets with toxic products, putting at risk the whole economy (Crotty, 2009).

In 1980, the sum of all profits and wages paid to financial intermediaries represented 5% of the GDP. In 2006, this value reached 8.3%, with finance actually growing even relative to the nonfinancial services sector (Philippon, 2012; Greenwood and Scharfstein, 2013; Antill, Hou, and Sarkar, 2014)

When the bubble burst, the main responsibles for most malpractices were not forced to pay the full consequences of their practices, the lack of regulation during the previous years allowed them to merge and to grow “too-big-to-fail”, forcing governments to step in order avoid the bankruptcy of these financial giants, which costs would be far greater than the cost of their bailout (Crawford, 2011).

Even if the crisis had its origins in the United States, all world was presenting symptoms of the same problem. Also in the Euro Area and on the United Kingdom, commercial bank's lending activities critically increased (Figures 8, 9 and 10) as the financial sector grew and became much more profitable and regulatory framework was slowly dismantled (Crawford, 2011; Ryan-Collins et al., 2011; Philippon, 2013).

In fact, the response of the Federal Reserve, the European Central Bank, and other central banks to this systemic threat was immediate and dramatic, as these central banks purchased $2.5 trillion of government debt and toxic assets from commercial banks. This measure was the largest liquidity injection into the credit market, and the largest monetary policy action, in world history. Not to stop here, as the governments of the United States and of European nations also raised the capital of their national banking systems by $1.5 trillion, to purchased newly issued preferred stock in their most important banks (Altman, 2009).

The great irony is that after overflowing the system with cheap credit, creating a financial crisis and being bailed out, when central banks tried to incentivize commercial banks to lend, as a result of rising deflationary pressures, aiming to avoid a debt deflation and trying stimulate the economy, commercial banks finally decided that lending, when it became needed, was not such a good idea as banks had lost their confidence on the market.

The consequent situation and unconventional monetary policies, such as Quantitative Easing, demonstrated the limited influence of central banks to increase the money supply by manipulating the amount of base money and flooding the system with reserves, without any noticeable impact on lending as it can be seen in Figures 11 and 12 (Disyatat 2009).

Cecchetti and Kharroubi (2015), considering these last events and their impact on the general economy, reached an important conclusion regarding the real effects of financial sector growth: The growth of a country's financial system is a drag on productivity growth, as higher growth rates in the financial sector reduces real growth.

Consequently, not only financial institutions (including commercial banks) have a key role behind financial crisis, but also the financial booms they create are not even

growth-enhancing, as financial sector competes with the rest of the economy for resources.

By stepping in and bailing out those organizations governments and central banks worldwide may have been able to prevent an even greater disaster, however it is important to notice that after everything what happened, in 2010, the sum of all profits and wages paid to financial intermediaries in the US, was able to raise to 9% of the GDP (Philippon, 2011).

Chapter analysis

The current research shows that the amount of money created by commercial banks is currently not actively determined by regulation, the government or central banks, but largely by the confidence of the banks at any particular period in time.

When commercial banks are confident, they expand credit and create new money in the form of new bank deposits for borrowers. When they are fearful, they limit lending, strangling the creation of new broad money. If more loans are repaid than issued, the money supply will shrink. Effectively, the size of the money supply of a State, depends mainly on the confidence and incentives of commercial banks.

The modern capitalist economy has inherent instability associated to it and that both commercial banks and governments are to blame for cyclical credit booms, bubbles, financial crisis and recessions that naturally emerge from uncontrolled bank lending.

The current monetary structure is extremely beneficial for commercial bank not only because in case of mismanagement the government is forced to intervene, but mainly because there is a systemic dependency on money and consequently on the role of commercial banks, which enables a constant transfer of wealth and accumulation of purchasing power from the rest of the economy to the banking sector.

This demand for credit not only is driven as the result of people wanting to borrow, but also by the necessity of credit for the economy to function.

The process through which money is created and destroyed demands that, for the economy to function, people need to constantly get in debt at least at the same rate that

money is destroyed, for a constant level of the money supply to be maintained and to avoid debt deflation.

If credit is created at a faster rate than it is being repaid, the money supply grows and there is an adaptation of the level of activity within an economy to the new and increased availability of money. If, on the opposite, the more credit is being repaid than new is being created, there is a shrinkage on the money supply as more money is being destroyed than created. If the shrinkage of the money supply lasts the economy will slow down as without enough money in circulation to sustain the previous level of economic activity, firms' revenues drop as consumption falls and firms need to restructure to avoid bankruptcy, leading to lower wages, higher levels of unemployment and even bankruptcies.

In other words, for the economy to work the amount of credit being taken needs to keep increasing at least at the same rate that money is destroyed to avoid debt deflation, consequently, people need to constantly get in debt, as debt is the other side of credit.

For firms to keep operating and even expand, for there to be business and employment, for there to be economic growth, credit needs to keep expanding, however not excessively, simply at a higher rate than it is being repaid.

The economy is addicted to credit, which on its turn is a form of money created by the commercial bank as it was previously developed. In other words, the economy is addicted to a form of money actively managed by private entities, which is associated to a an equal amount of debt, as every time a bank makes a loan and therefore creates credit, an equal amount of debt is created.

This addiction and the mechanism supporting it, simply aligns with the argument made on the previous chapter analysis: On the same way that States by taxing the public create a demand for money by creating an obligation to settle with this entity, the dependency of the economy on credit, due to the way money is created, constantly generates debt and the obligation for the population to settle with its creditor.

In other words, this phenomenon ends up supporting the argument made on the current essay, which states that people use money because the process through which it is created generates a debt-obligation between banks and the population, which can only be settled by delivering money to these entities.

Chapter 4: Conclusion

4.1) Key findings - for other important findings and suggestions on further research, see Appendices: point 4.2 and 4.3.

Money, most of all, is a generally accepted unit performing four essential functions. Money is a medium of exchange which facilitates trade; a generalized and agreed upon unit of measurement of value, to enable debt settlement and the establishment of an effective price. It is a mean of store of value, enabling the population to hold it for future access of goods and services, without easily deteriorating. Finally, by fulfilling this conditions, money becomes a mean of final payment, an accepted way to settle a debt. Those functionalities are the main roles of money within a society.

According to the Metallist and the Chartalist theories of money, all these functionalities of money are either mere consequences from the necessity for people to find an efficient way to satisfy their necessities or from the necessity to settle their obligations with the State.

As long as there is an infinite number needs and a great variety of ways to satisfy them, mankind will always search for a way to facilitate the process through which the common man can achieve the necessary tools to satisfy his needs. Therefore, money exists. The first logical reason why people use money is because it facilitates the process through which the population can have access to means to satisfy their needs. The greater the number of agents within a system, the greater the number of necessities and even greater the variety of ways to satisfy them. In the context of such complexity, neither barter nor the debt-credit systems used in ancient civilizations, would be able to face such colossal difficulties.

The way chosen to circumvent the complexity of trading in such a rich context, was by “naming” objects which would be accepted by everyone.

Almost as a natural way to elect these objects, governments, communities and palaces, thousands of years ago, started forcing the population to pay taxes, penalties and fees with certain commodities. By doing so, these entities started creating a generalized acceptably of certain goods as everyone, within the domain of those communities, needed those objects to settle with these governing institutions. Soon after people began

accepting those commodities to settle among themselves. Nowadays, this is still done by States and governments and is the second reason why people use money: it is the only way to extinguish their debts and obligations to the State.

In addition to these reasons, there is a third one, which came to be as a consequence of the modern monetary system and is related to the process through which money is created nowadays.

In the current days, most forms of money are either created by central or commercial banks, namely banknotes/cash or coins and commercial bank money/bank deposits. With the commercial banks being responsible for the creation of the great majority of the money supply, through the process of lending.

As seen, acceptability and law determine what money is. Credit, normally in the form of bank deposits, is both accepted and legally defined as a form of money.

Every time a bank makes a loan, new money, in the form of credit, is created associated to an equal amount of debt, as a certain amount of bank deposits became available to the person contacting the loan, which in his turn agreed to repay that amount to its creditor in a future date. In the same line of thought, every time a loan gets repaid, money is destroyed, as the debt is repaid, the deposits cease to exist.

For every cent of freshly created money by commercial banks, an equal amount of debt is created, therefore there is always someone who owes that amount to the bank, the creditor. Even the amount of money created by central banks, which can be used by the population - namely cash and coins – are delivered to commercial banks which then become the responsibles for putting it into circulation. However, for the general public to have access to cash, it needs to be withdrawn from commercial banks by swapping bank deposits for the desired amount of banknotes.

Bank deposits, in this sequence, are not only a form of debt owed to commercial banks, but also a pre-requisite to access cash. Consequently, not only for there to be commercial bank money an equal amount of debt to the commercial banks is required, but also for people to have access to cash and coins, someone must be in debt to the banks.

The dependency on credit is so serious that for firms to keep operating and even expand, for there to be business and employment, for there to be economic growth, credit is needed.

If, by any number of reasons, credit is created at a faster rate than it is being repaid, money supply will grow. With a greater money supply, economic activity adapts to this new and increased availability of money, wages and employment increase just as economic growth. If, on the opposite, more credit is being repaid than new is being created, there is a shrinkage on the money supply as more money is being destroyed than created. This shrinkage, may even lead to a debt deflation, as the economy slows down due to the lack of money to sustain the previous level of economic activity. Firms' revenues will drop as consumption falls, firms will need to restructure to avoid bankruptcy, which will lead to lower wages, higher levels of unemployment and even bankruptcies, or finally a recession.

This ultimately proofs that the demand for credit is not only driven as result of people wanting to borrow, but also by the necessity of credit for the economy to function. This dependency on credit, associated to the process through which money is created, constantly generates a debt obligation between the population and its creditor. This is the third reason why money is used nowadays.

On the same way that States by taxing the public and creating an obligation to settle with this entity create demand for money, the dependency on money and the process through which money is created and put in circulation makes the population to always be indebted to the banking system, consequently generating a demand for money for people to be able to settle with their creditor.

Summarizing, there are functional and structural reasons why societies NEED to use money:

First, it facilitates the way society can access means to satisfy their necessities; second, it is necessary for the population to settle their obligations with the State; and third, because of the way money is created which generates a constant state of indebtedness and the obligation for the people to settle with their creditors.

Bibliography

Antil, S. Hou, D. Sarkar, A. 2014. Components of U.S. Financial-Sector Growth, 1950-2013. ***FRBNY Economic Policy Review***.

Babecký, J. Havránek, T. Matějů, J. Rusnák, M. Šmídková, K. Vašíček, B. 2013. Leading indicators of crisis incidence: Evidence from developed countries. ***Journal of International Money and Finance***. Volume: 1-19

***Bank of Canada*.** 2009. *Financial System Review*.

Bank of England, ***Bank of England Website:*** (29/10/2015) http://www.bankofengland.co.uk/banknotes/pages/about/history.aspx

Bank of England, ***Bank of England Website:*** (29/10/2015) http://www.bankofengland.co.uk/statistics/Pages/iadb/notesiadb/m0.aspx

Bernanke, B. 2010. ***Statement by Ben S. before the Financial Crisis Inquiry Commission***. Washington, D.C.

Binswanger, M. 2009. Is There a Growth Imperative in Capitalist Economies? A Circular Flow Perspective. ***Journal of Post Keynesian Economics***. 31(4): 707-727.

BIS (Bank for International Settlements). BIS website: (29/10/2015) http://www.bis.org/bcbs/about.htm

Blanchard, O. 2006. **Macroeconomics** (4th Ed.). N.J.: Pearson Prentice Hall.

Bell, S. 1996. The Hierarchy of Money. **Working Paper No. 231.** The Jerome Levy Economics Institute.

Case, Karl E., Ray C. Fair, Manfred Gartner, and Ken Heather. 1996. ***Economics*** (4th ed.). London: Prentice Hall.

Cecchetti, G. and Kharroubi, E. 2015. Why does financial sector growth crowd out real economic growth? ***BIS Working Papers No 490***. Monetary and Economic Department.

Chicks, V. 1978. Unresolved questions in monetary theory: A critical review. ***De Economist.*** Volume 126, Issue 1, pp 37-60.

Clower, R. W. 1984. ***A Reconsideration of the Microfoundations of Money. Money and Markets: Essays by Robert W.*** Ed D.A. Walker, Cambridge: Cambridge University Press, pp. 81-89.

Crotty, J. 2009. Structural causes of the global financial crisis: a critical assessment of the 'new financial architecture***". Cambridge Journal of Economics*** 33, 563–580.

Davidson, P. 2008. ***The Financial Crisis, the US Economy, and International Security in the New Administration. Looking for Solutions to the Crisis***. International Initiative for Rethinking the Economy.

Davies, G., 2002. ***A History of Money***. Cardiff: University of Wales Press.

Demirguc-Kunt, A., & Detragiache, E. 2002. Does Deposit Insurance Increase Banking System Stability? An Empirical Investigation. ***Journal of Monetary Economics***, 49 (7), (pp. 1373-1406).

Disyatat, P. 2010. The bank lending channel revisited. ***BIS Working Papers***, 297.

Duhigg, C. 2008. Depression, You Say? Check Those Safety Nets. ***The New York Times,*** March 23, 2008.

ECB (European Central Bank). 2000. Domestic payments in Euroland: commercial and central bank money. Speech by Tomasso Padoa-Schioppa, Member of the Executive Board of the European central bank, at the European Commission Round-Table Establishing a Single Payment Area: State of Play and Next Steps, Brussels, 9 November 2000, quoted in Werner, R., (2009). op. cit., p.5

ECB (European Central Bank). 2011. The Monetary Policy of the ECB: (29/10/2015)

https://www.**ecb**.europa.eu/pub/pdf/other/**monetarypolicy**2011en.pdf

ECB (European Central Bank***)***. ***ECB website:*** (29/10/2015)
https://www.ecb.europa.eu/stats/money/aggregates/emon/html/index.en.html

ECB (European Central Bank). ***ECB database***: (29/10/2015)
https://www.ecb.europa.eu/press/pr/stats/md/html/index.en.html

Evans, A. (2010). ***Public Attitudes to Banking***. The Cobden Centre

FED (Federal Reserve System). ***FED website***: (29/10/2015)
http://www.federalreserve.gov/paymentsystems/coin_currcircvalue.htm

Federal Reserve System. Supervision and Regulation Task Force on Securitization**.** An Introduction to Asset Securitization. Volume 1.

Financial Crisis Inquiry Commission. 2011. The Financial Crisis Inquiry Report. Final Report of the National Commission on the Causes of the Financial and Economic Crisis in the Unites States. Official Government edition. Pursuant to Public Law 111-21.

Fisher, I. 1933. The Debt-Deflation Theory of Great Depressions. ***Econometrica***, 1(4): 337-357.

Geisst & Charles R. (2005). ***Encyclopedia of American business history*****.** New York. p. 39. ISBN 978-0-8160-4350-7.

Goodhart, C. 1989. ***Money, Information and Uncertainty*****.** London: Macmillan.

Goodhart, C. 2001. ***The endogeneity of money. Money, Macroeconomics and Keynes, Essays in Honour of Victoria Chick***. ***Routledge Frontiers of Political Economy:*** 14-24. Routledge: London, UK.

Goodhart, C. 2003**. A Reply to the Contributors**. Ed S. Bell and E. Nell, *The State, the Market and the Euro*, Cheltenham, UK: Edward Elgar, pp. 184-196.

Graeber, D. (2011). ***Debt: The First 5000 Years. New York***: Melville House.

Greenwood, R., and D. Scharfstein. 2013. "The Growth of Finance." ***Journal of Economic Perspectives 27***, no. 2 (Spring): 3-28.

Hoggson, N. F. (1926) ***Banking Through the Ages***. New York, Dodd, Mead & Company.

Holt, J. 2009. A Summary of the Primary Causes of the Housing Bubble and the Resulting Credit Crisis: A Non-Technical Paper. ***The Journal of Business Inquiry***, 8, 1, 120-129: (29/10/2015)
http:www.uvu.edu/woodbury/jbi/articles

Huber, J., Robertson, J., (2000). ***Creating New Money: A Monetary reform for the information age***. London: ne
Humphrey, C. 1985**.** ***Barter and Economic Disintegration Man***. Man, New Series, Vol. 20, No. 1 (Mar., 1985). Royal Anthropological Institute of Great Britain and Ireland: pp. 48-72

Independent Commission on Banking. 2010. Issues Paper: Call for Evidence, pp. 144-145, Retrievable from http://bankingcommission.independent.gov.uk/wp-content/uploads/2010/07/Issues-Paper-24-September-2010.pd

Innes, A.M., (1913). What is Money***? Banking Law and Journal May***: 377-40

Jackson, A., & Dyson, B. 2013. ***Modernising Money: Why Our Monetary System is Broken and How it Can be Fixed.*** **London:** Positive Money.

Jobst, A. 2008. Finance & Development. ***International Monetary Fund. External Relations Dept.***

Kennedy, M. 1995. Interest and Inflation Free Money. ***Seva International***. ISBN 0-9643025-0-0.

Keynes, J. M**.** 1930. ***A Treatise on Money***. New York: Harcourt Brace.

Keynes, J. M. 1936. ***The General Theory of Employment, Interest and Money MacMillan***

Rothbard, M. ***America's Great Depression*** (Ludwig von Mises Institute, 2000), pp. 159–163.

King, M. 1994. The Transmission Mechanism of Monetary Policy. ***Bank of England Quarterly Bulletin***: 261-267.

Knapp, G.F. 1905. ***The State Theory of Money***. Abridged and trans. by H.E. Batson, London: Routledge and Kegan Paul.

Knapp, G.F. 1973 [1924], ***The State Theory of Money***, Clifton, NY: Augustus M.

Kelley.

Kydland, F., & Prescott, E. 1990. Business cycles: Real facts and a monetary myth. ***Federal Reserve Bank of Minneapolis***, Quarterly Review 14: 3-18.

Laeven, L., & Valencia, F. 2012**.** ***Systemic Banking Crises Database: An Update***. IMF Working Paper no 12-163, International Monetary Fund.

Laidler, D. 1987. ***Fiat Money. The New Palgrave: Money.*** Ed John Eatwell, Murray Milgate, and Peter Newman. New York and London: W.W. Norton, pp. 20-21.

Lerner, Abba P**.** 1947. ***Money as a Creature of the State***. American Economic Review, Vol. 37, No. 2, pp. 312-317.

Mauss, M., (1966). ***The Gift***. London: Cohen & West.

McLeay, M., Radia, A., & Thomas, R. 2014. ***Money creation in the modern economy.*** Bank of England, Quarterly Bulletin.

McLeay, M., Radia, A., & Thomas, R. 2014. ***Money creation in the modern economy***

: An Introduction. Bank of England, Quarterly Bulletin.

Mehrling, P. 2012. ***The Inherent Hierarchy of Money***. Duncan Foley festschrift volume.

Mill, J. S. 1848 [1909]. ***Principles of Political Economy with some of their Applications to Social Philosophy.*** Ed Ashley, W, 7th ed. London; Longmans, Green and Co.

Minsky, H. (1986), ***Stabilizing an Unstable Economy***. New Haven, CT: Yale University Press.

Moore, B. 1988. ***Horizontalists and Verticalists***. Cambridge: Cambridge U.P.

Moore, B 2006. ***Shaking the Invisible Hand: Complexity, Choices and Critiques.*** Palgrave Macmillan.

OECD (Organization for Economic Co-operation and Development). ***OECD website:*** (29/10/2015) http://stats.oecd.org/glossary/index.htm

Philippon,T. 2011. ***The Size of the U.S. Finance Industry: A Puzzle?***. Working Paper

Philippon,T. and A. Reshef. 2013. "An International Look at the Growth of Modern Finance." ***Journal of Economic Perspectives 27***, no. 2 (Spring): 73-96.

Philippon,T. 2014. "Has the U.S. Finance Industry Become Less Efficient? On the Theory and Measurement of Financial Intermediation." ***NBER Working Paper no. 18077***, May.

Reinhart, C. M., Rogoff, K, S., (2009). ***This Time is Different: Eight Centuries of Financial Folly.*** Princeton: Woodstock

Reis-Roy, Calvin (1998). ***Journal of International Banking Law*** **13** (9): 298–304.

R. C. Altman. 2009. ***The Great Crash". Foreign Affairs.*** *Retrieved February 27, 2009.*

Ryan-Collins, J., Greenham, T., Werner, R., & Jackson, A. 2011. ***Where Does Money Come From? A Guide to the UK Monetary and Banking System.*** London: nef.

Shull, B. 2010. ***Too Big to Fail in Financial Crisis: Motives, Countermeasures, and Prospects.*** Working Paper No. 601**.** Hunter College, CUNY Special Consultant, National Economic Research Associates.

Schularick, M., & Taylor, A. 2009. ***Credit Booms Gone Bust: Monetary Policy, Leverage Cycles, and Financial Crises, 1870-2008***. NBER Working Paper 15512. National Bureau of Economic Research

Smith, A. (1776) ***The Wealth of Nations***. Edwin Cannan, ed 1904 5th edition, London: Methuen & Co., Ltd

Spufford, Peter. 1988. ***Money and Its Use in Medieval Europe.*** Cambridge: Cambridge University Press.

Taylor, J.B. (2009). The financial crisis and the policy response: an empirical analysis of what went wrong***, NBER Working Paper***, No. 14631.

Tobin, James and Stephen S. Golub**.** 1998**.** ***Money, Credit, and Capital.*** New York: Irwin/McGraw-Hill.

Tcherneva, P. 2005. ***The Nature, Origins, and Role of Money: Broad and Specific Propositions and Their Implications for Policy.*** Working Paper No. 46

United Nations (UN). World Economic Situation and Prospects 2015. Development Policy and Analysis Division of the UN secretariat. Retrieved March 25, 2015.

Von Glahn, R. 1996. ***Fountain of Fortune: Money and Monetary Policy in China, 1000–1700,*** Berkeley: University of California Press.

Verick, S. Islam, I. 2010. ***The Great Recession of 2008-2009: Causes, Consequences and Policy Responses.*** IZA DP No. 4934

Werner, R. (2005). ***New Paradigm in Macroeconomics: Solving the Riddle of Japanese Macroeconomic Performance.*** New York: Palgrave Macmillan

Werner, R. 2012. T***owards a New Research Programme on'Banking and the Economy' – Implications of the Quantity Theory of Credit for the Prevention and Resolution of Banking and Debt Crises.*** Centre for Banking, Finance and Sustainable Development, Southampton Management School, University of Southampton, Southampton SO17 1BJ.

World Bank. ***World Bank database***: (29/10/2015)
http://data.worldbank.org/indicator/FM.LBL.BMNY.CN?page=2

Wray, L. R. 1998. ***Understanding Modern Money: The Key to Full Employment and Price Stability***. Chapter 3. Cheltenham: Edward Elgar p. 43

Young, A. 1929. ***The Book of Popular Science. The mystery of money. How modern methods of making payments economize the use of money. The role of checks and bank-notes. The enormous edifice of credit.*** New York: The Grolier Society. (p.269)
Yin, R. 2009. Case study research: Design and methods (4th ed). Thousand Oaks, CA: Sage.

Appendices

4.2) Other important findings

A collateral conclusion of the current essay, that could not be avoided to be discussed, is the privileged position that commercial banks face in the modern economic system. The systemic need for money, not only allows a constant transfer of wealth and accumulation of purchasing power from the rest of the economy to the banking sector, but also gives commercial banks a tremendous power to influence and shape most of the economy. Their influence can be even compared to democratically elected governments, as banks decide where most money is allocated, deciding to whom to lend.

In fact, the banking sector allocates more money via lending than the government allocates via public spending. According to Jackson and Dyson (2012), during the five years before the financial crisis, the UK banking sector's gross lending to households and individuals alone, without including lending to businesses, came to a total of £2.9 trillion. During the same period, the total government spending was less at £2.1 trillion.

The main difference between banks and the government is that their ultimate objective is profitability instead of development.

By choosing in which sector to allocate money, banks are allowed to protect their interests and the interests of their partners in key profitable sectors of the economy. Neither the quantity nor the direction of bank lending is determined by "the market", as a result, new money is often more likely to be channeled into property and financial speculation than to small businesses and manufacturing. Consequently, this leads banks to favor lending against collateral, instead of lending for investments in areas such as production, start-ups and other key strategic areas for the economy.

To make the problem bigger, small and medium sized businesses, which provide a large part of the growth and the majority of the employment in any economy, rely on banks to provide most of the needed funds for investment and growth, as these units are unable to access capital markets. As a result governments need bank lending, not only to put in circulation most of the monetary base, but also to allow the development of the mentioned strategic units.

These facts have enormous consequences on a "free society" as most business and projects to be successful, or even to survive, are dependent on the banking sector endorsement. On an economy with a large number of small banks, no single bank would have any control over the direction of the economy, but that is not the case of the modern economy.

The key problem is that instead of have been developing more efficient tools to regulate and keep up with the financial innovation of the last years, successive governments have been dismantling the regulatory structure created to control commercial banks operations. The consequence is the appearance financial conglomerates that became too-big-to-fail and which bankruptcy may risk the collapse of the entire system, forcing governments to intervene and support commercial banks in case of mismanagement.

Nowadays, banks not only cannot be allowed to fail and are benefiting from a system that is dependent on their economic role, as the entire money supply must be borrowed from commercial banks to come into circulation, but also their excessive lending has been an underlying cause of certain phenomena such as credit booms and consequent bubbles and their burst, wealth inequality, debt deflations, etc. Not only can't the previous phenomena be avoided within the present framework, but also constant indebtedness, bankruptcies, precariousness and poverty can be linked to the current framework of the financial system.

To conclude, money besides all symbolism, is a necessity of the present system. People use it because it facilitates the access to means to satisfy their necessities. Use it as it is the only way to pay taxes and to extinguish the debt relation between the State and its citizens. Finally, money is used as a consequence of the current process through which money itself is created, which generates itself a demand for it. A direct consequence of this systemic necessity for money is the privileged position and influence of commercial banks in the modern economy.

Unfortunately, these institutions have been misusing their power and are the main reason behind a variety of problems within the current system. However, although there are many problems with current system, and even a theoretical gap between money, finance and the study of the economy, the underlying issue behind the current situation is not only that successive governments have been ceding the control of such an important

resource, the power to create new money, to private, profit seeking financial institutions, but also there is a generalized and deliberated lack of action to tackle and regulate a system that constitute the root causes of some of the greatest problem of the modern times.

4.3) Limits of the current research and suggestions for future studies

Considering the topics analyzed within the current essay there is a considerable amount of research that can still be developed and further explored, mainly related with the functioning of the modern monetary system.

Since the failure of Bretton Woods' agreement, currency worldwide started to freely float against each other. It would be interesting to further understand the impact of lending and money creation of one currency and its fluctuation against another, and which are the entities and mechanisms used to manage those international relationships.

Regarding the banking system there are three topics that I wanted to have further explored, but could not due to the limited size of the dissertation.

The first one would be a deeper explanation about the settling interbank operations among the commercial banks and the central banks within a country and worldwide, including the lending and borrowing operation within the interbank market.

Secondly, it would have been extremely interesting to have tested more accurately and taking in consideration the enormous amount of recent data regarding the financial crisis and the effect of central bank's policies on the money supply, the causality between base money and lending, through linear regressions or by testing the Granger causality amongst the variables. There are studies associated to this tests, such as the ones made by Moore (1988), but none that I have heard of reflect an amount of information so accurate as the data available today.

Third, it would have been interesting to address the Basel III framework, which was created as a consequence of the later financial crisis. I am curious to understand which new rules have been put in place and if any effective way was created to limit the ability of commercial bank to securitize their loans and circumvent the capital requirements established by previous versions of the Basel agreements. It would also be

interesting to understand which measures were put in place to deal with the "too-big-to-fail" and systemic risk situation associated to some financial institutions.

A conclusion of this essay is that there is a theoretical gap between money and finance, and the study of the economy. The analysis of some of the implications of the Quantity Theory of Credit (Werner, 2012) regarding this topic can help towards closing of that same gap.

To finalize, I just want to make one last note. By the time I was analyzing the level of bank loans of American commercial banks, I realized, as it can be seen in Figure 13, that the level of loans already went further beyond the level reached before the crisis, and it is still rising. This situation alerted me. It would be of key interest to trace and understand for what are those loans being used for and if there is a possibility of a new bubble being in development.

Tables

Table 1) – Monetary aggregates - M1, M2, and M3.

Liabilities (1)	M1	M2	M3
Currency in circulation	X	X	X
Overnight deposits	X	X	X
Deposits with an agreed maturity up to 2 years		X	X
Deposits redeemable at a period of notice up to 3 months		X	X
Repurchase agreements			X
Money market fund (MMF) shares/units			X
Debt securities up to 2 years			X

(1) Liabilities of the money-issuing sector and central government liabilities with a monetary character held by the money-holding sector.

Source: ECB - https://www.ecb.europa.eu/stats/money/aggregates/aggr/html/hist.en.html

Table 2) – Euro Area Currency, Broad Money, and Ratio (in billions of euros)

Euro Area	2000	2002	2004	2006	2008	2010	2012	2014
Currency	337	320	453	575	704	796	864	967
Broad Money	5013	5721	6485	7652	9364	9546	9741	10309
Ratio	6,72%	5,59%	6,99%	7,51%	7,52%	8,34%	8,87%	9,38%

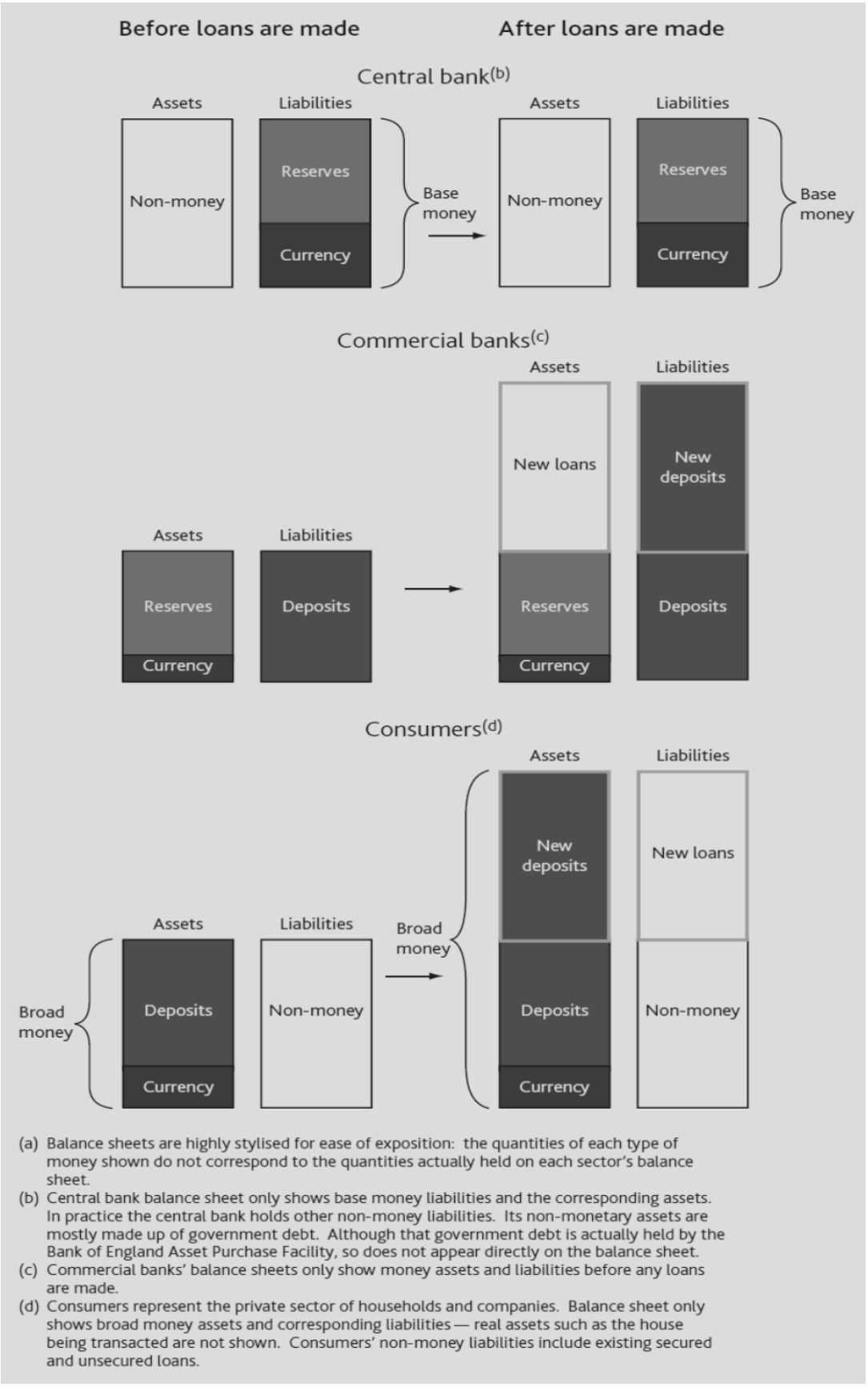
Source: ECB database

Table 3) – US Currency, Broad Money, and Ratio (in billions of dollars)

United States	2000	2002	2004	2006	2008	2010	2012	2014
Currency	563,8	654,7	719,8	783,4	853,1	942,1	1127	1299,1
Broad Money	7023	7879	8702	10261	12405	12678	14198	15588
Ratio	8,03%	8,31%	8,27%	7,63%	6,88%	7,43%	7,94%	8,33%

Source: The Federal Reserve website and the World Bank database.

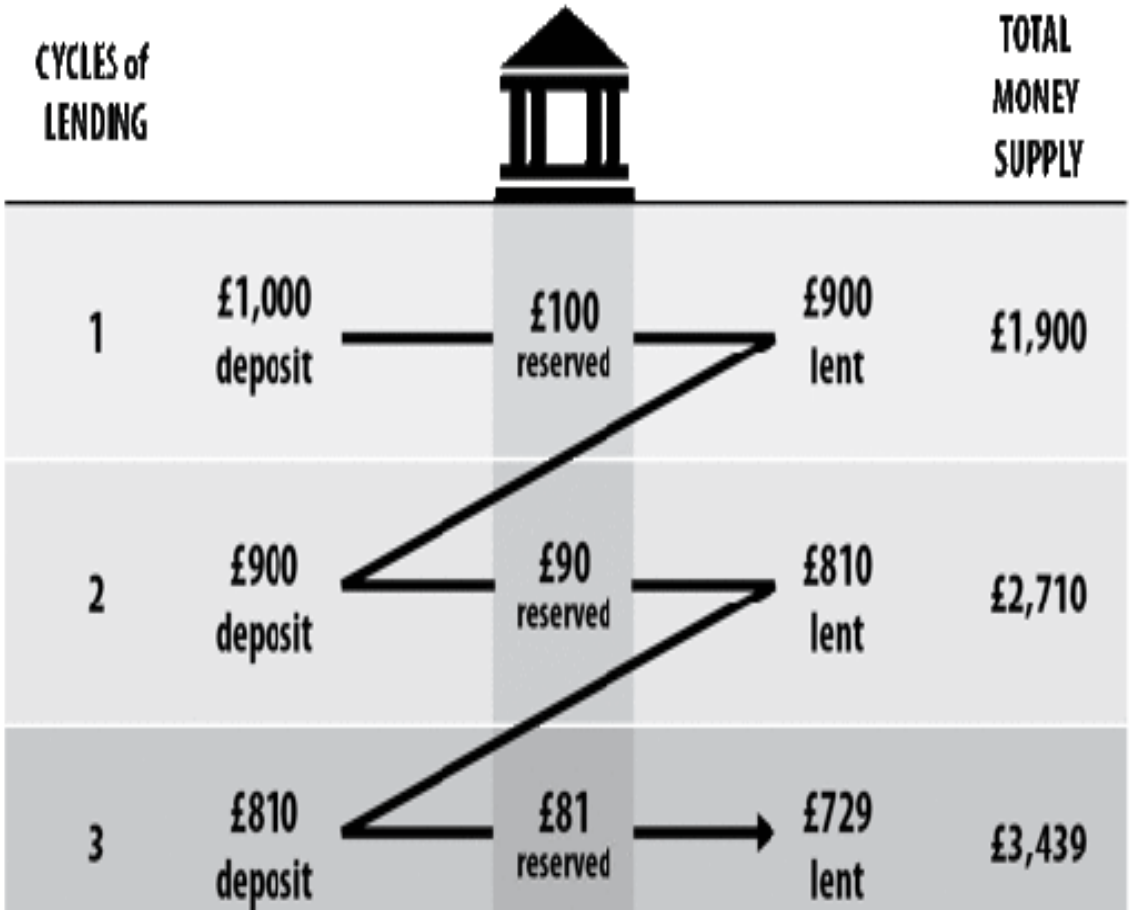
Figure 1 – Money creation through lending



(a) Balance sheets are highly stylised for ease of exposition: the quantities of each type of money shown do not correspond to the quantities actually held on each sector's balance sheet.
(b) Central bank balance sheet only shows base money liabilities and the corresponding assets. In practice the central bank holds other non-money liabilities. Its non-monetary assets are mostly made up of government debt. Although that government debt is actually held by the Bank of England Asset Purchase Facility, so does not appear directly on the balance sheet.
(c) Commercial banks' balance sheets only show money assets and liabilities before any loans are made.
(d) Consumers represent the private sector of households and companies. Balance sheet only shows broad money assets and corresponding liabilities — real assets such as the house being transacted are not shown. Consumers' non-money liabilities include existing secured and unsecured loans.

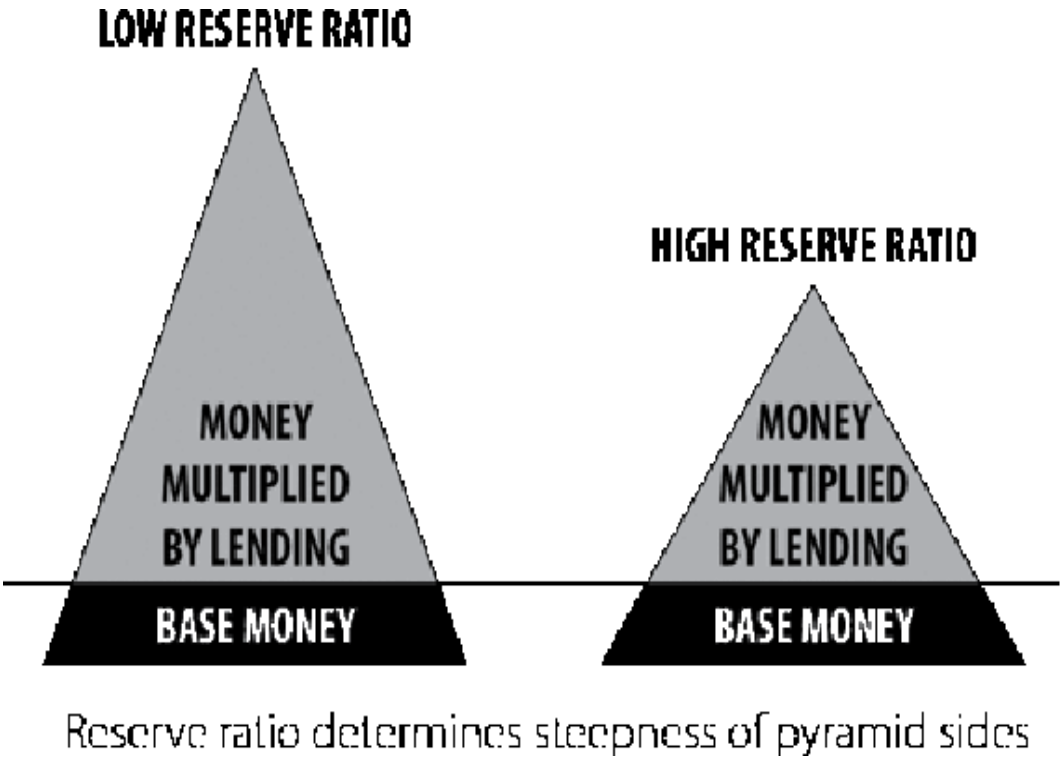
Source: McLeay et al. (2014: 3)

Figure 2 - Cycles of lending.



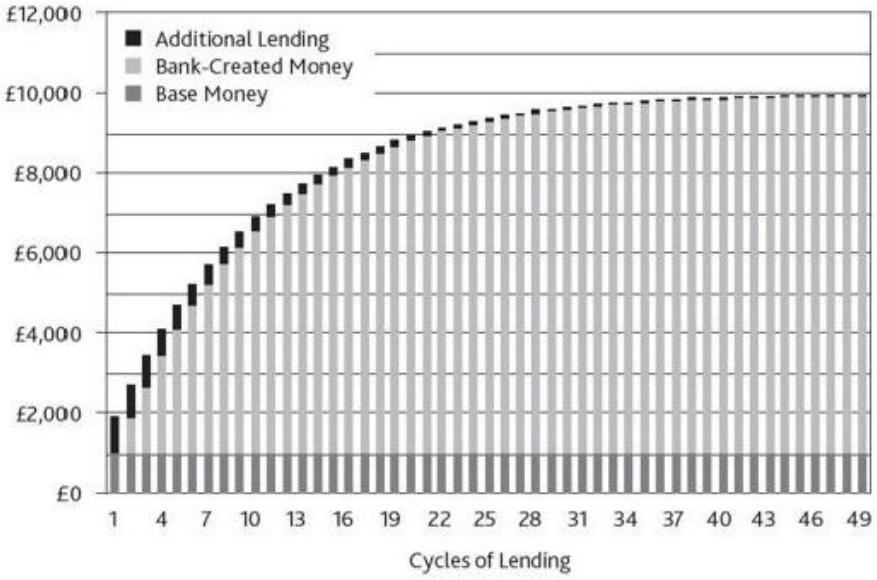
Source: Jackson and Dyson (2012:59)

Figure 3 - Reserve ratios pyramid.



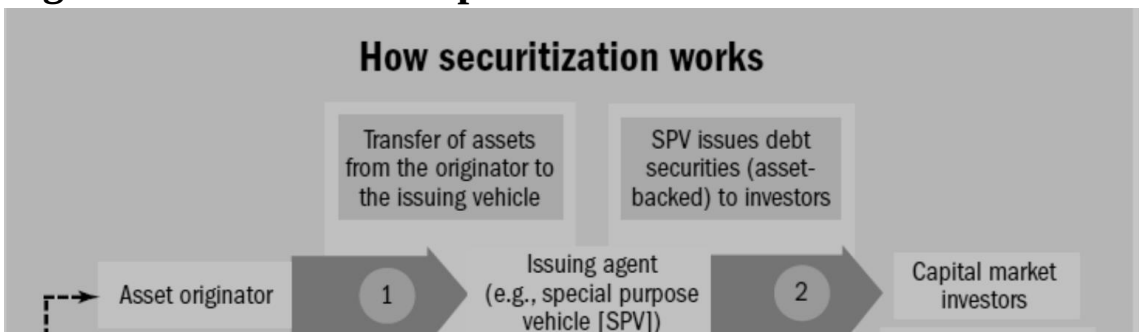
Source: Jackson and Dyson (2012:59)

Figure 4 - Money multiplier model.



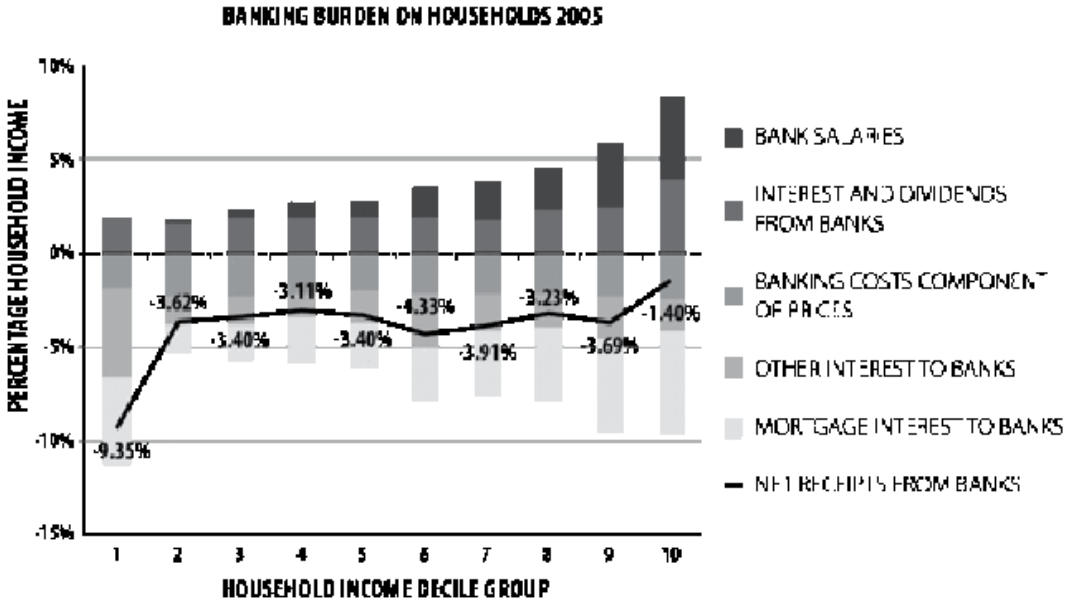
Source: Ryan-Collins et al. (2011:55)

Figure 5 - Securitization process.



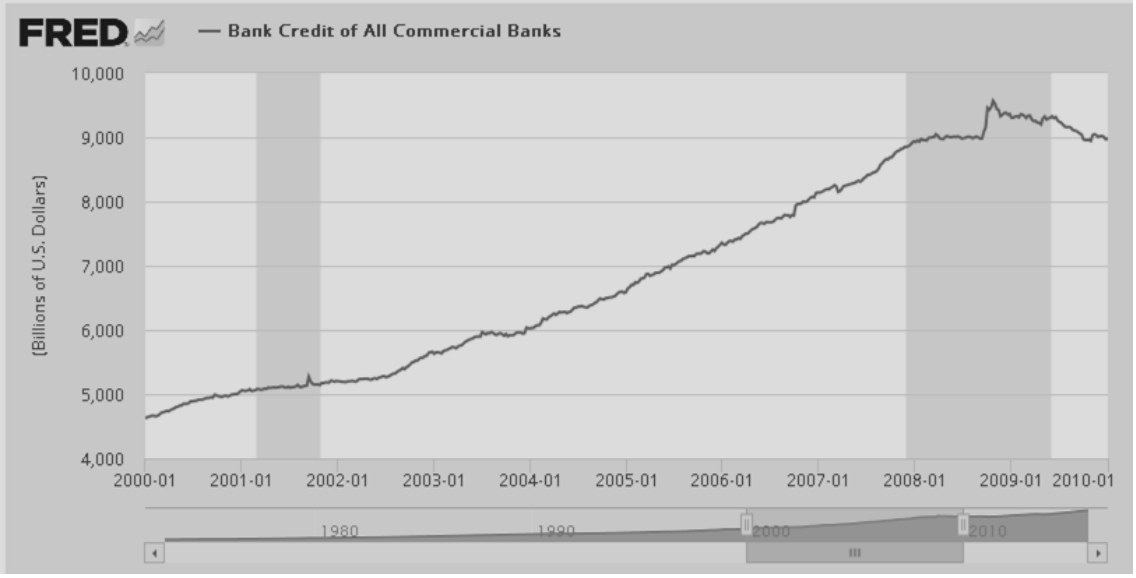
Source: Jobst (2008:48) (adapted)

Figure 6 - Banking burden on households 2005 - UK. Source: Jackson and Dyson (2012:127)



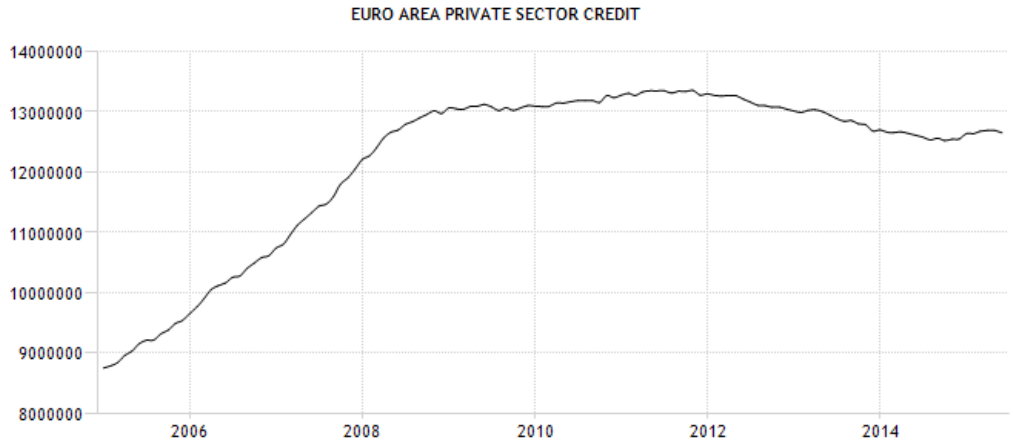
Source: Hodgson (2013)

Figure 7 - Bank Credit of All Commercial Banks US



Source: Board of Governors of the Federal Reserve System

Figure 8 - Bank Credit to Private Sector – Euro Area

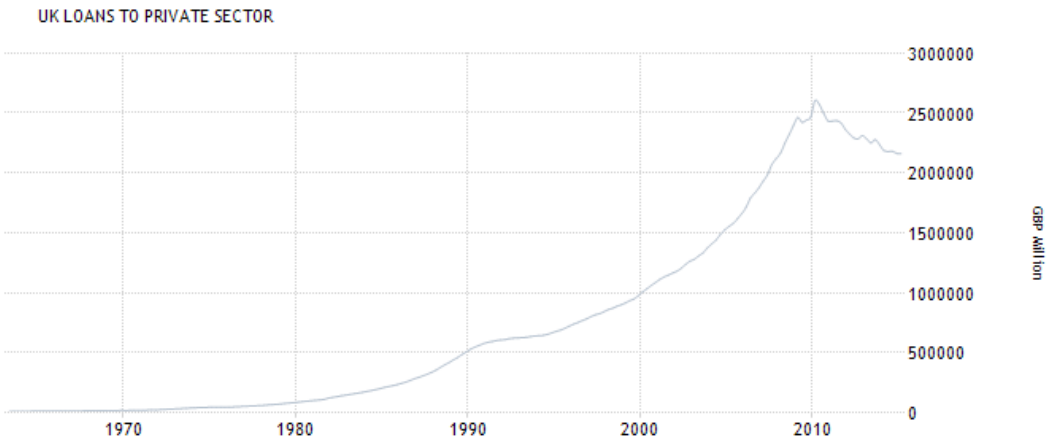


Source: ECB database – www.tradingeconomics.com

Figure 9 - Bank Credit to Consumer Sector – Euro Area

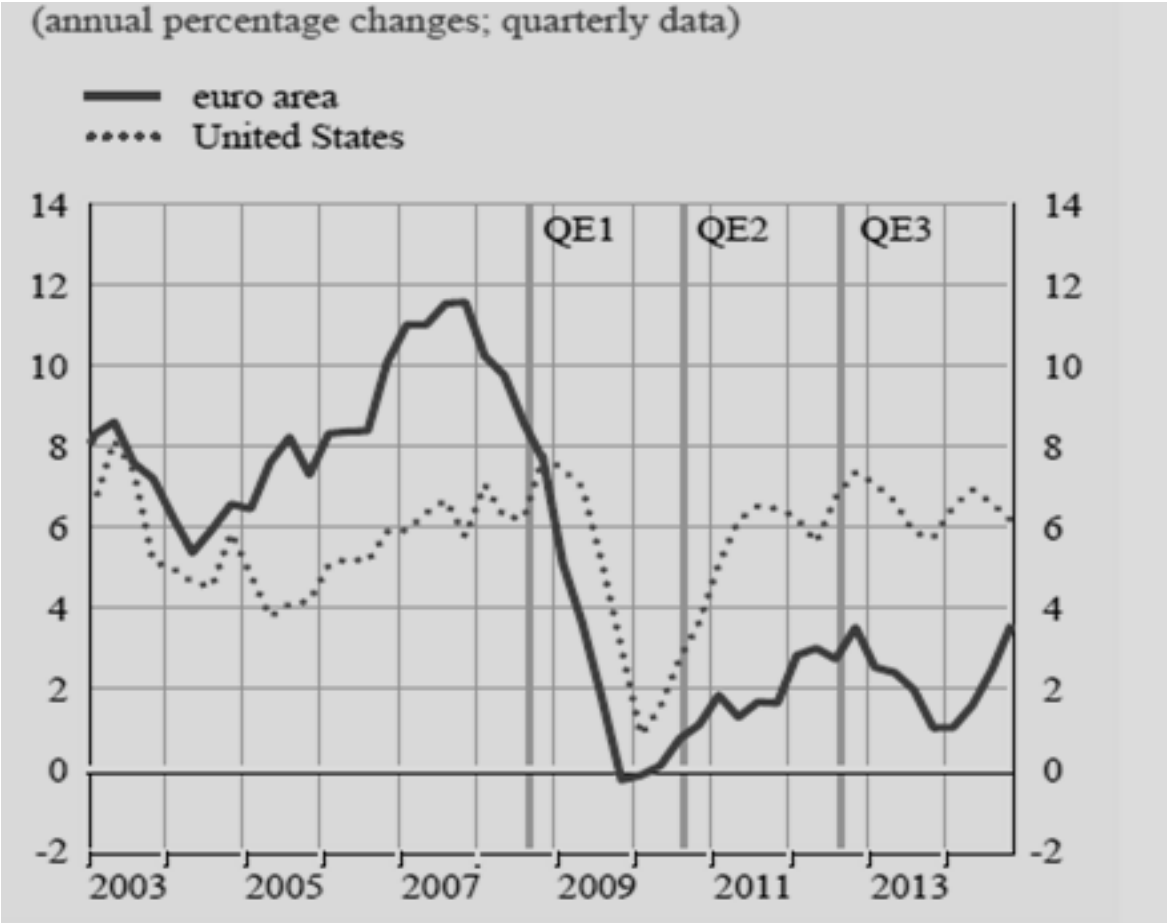
Source: ECB database – www.tradingeconomics.com

Figure 10 - Bank Credit to Private Sector – United Kingdom



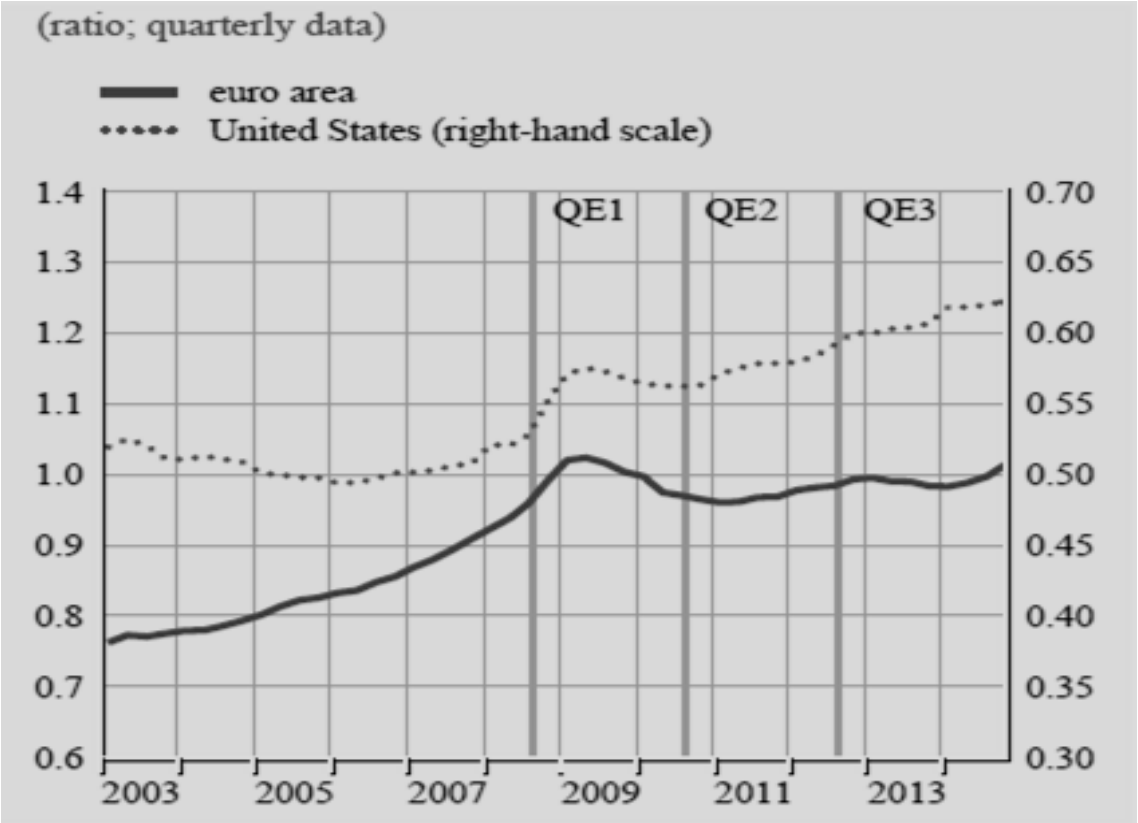
Source: Bank of England – www.tradingeconomics.com

Figure 11 - Percentage changes on M2 (US) and M3 (EU)



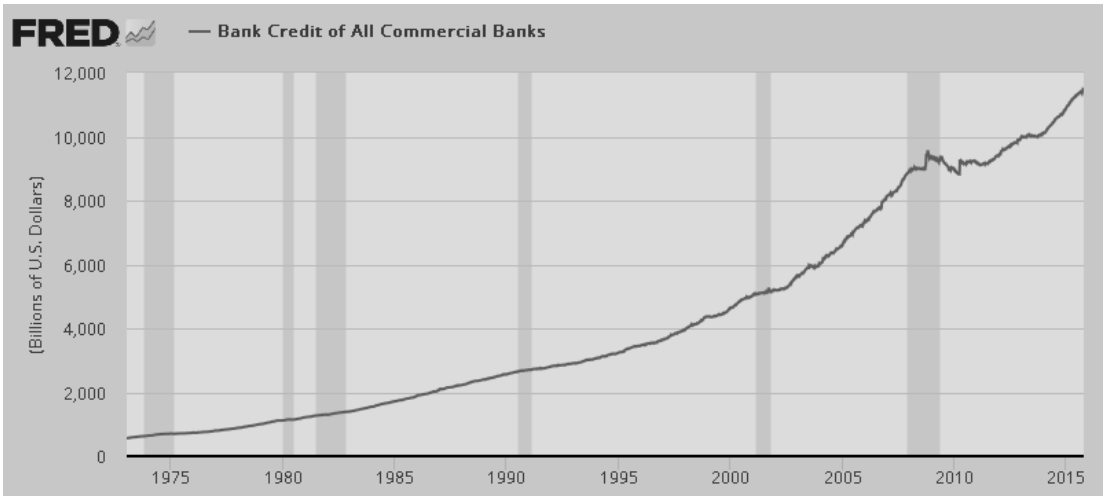
Source: ECB and Federal Reserve

Figure 12 - Base money



Source: ECB and Federal Reserve

Figure 13 - The return of Credit (US)



Source: Board of Governors of the Federal Reserve System