

## Louvain School of Management

Is the Current Monetary System Viable? What Are the Alternatives? Can  
Complementary Currencies Bring More Stability and Sustainability?

Research Master's Thesis submitted by  
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The elaboration of this master thesis and its many challenges would not have been possible without the help of several people. Therefore, we would like to take the time to thank them appropriately.

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*Hubert De Vlieghe & Nicolas Legrand*

<b>Disclaimer</b>
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The topic of this master thesis which encompasses money and, the monetary system and its alternatives is so vast and complex that we had to make some decisions in order to express our ideas in a succinct way. Therefore, not every aspect of this broad topic has been explored. Only the most important parts related to the topic have been developed letting some other parts out.

- Concerning chapter 3 about the alternatives, we are well aware that many other alternatives exist than the two that will be developed. However, one of the purposes of this thesis is to analyse the concrete impact and benefits as well as potential drawbacks of complementary currencies on the current economic and monetary system. Therefore, we chose that alternative above others. Cryptocurrencies have been emerging strongly during the past years and could bring something extra to complementary currencies. This is the reasoning behind our second choice.
- We will not be able to analyse all the different complementary currencies (systems) as many of them exist. They have different shapes, goals and vary strongly among each other. Therefore, we focussed our attention on several examples of complementary currencies we felt were extremely relevant. The aim of describing several initiatives is based on the will to show the practical aspect of complementary currencies in the real life. Our objective is therefore not to explore which system is the best as each one is specific for a particular field and purpose.
- As we are Western citizens, we also decided to focus more our attention on the Western system. Therefore, we often evoke the euro and dollar as well as Western projects. However, relevant ideas from other parts of the world like Japan have also been developed in this thesis

<b>Glossary</b>
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Chapter 1: Money

- Legal tender: “Any official medium of payment recognized by law that can be used to extinguish a public or private debt, or meet a financial obligation” (Investopedia, 2017).
- Electronic money: “Electronic store of monetary value on a technical device that may be widely used for making payments to entities other than the e-money issuer” (European Central Bank, 2017).
- Safe haven: “A safe haven is an investment that is expected to retain its value or even increase its value in times of market turbulence” (Investopedia, 2017).
- Bandwagon effect: “The bandwagon effect is a psychological phenomenon in which people do something primarily because other people are doing it, regardless of their own beliefs, which they may ignore or override” (Investopedia, 2017).
- Digital money: “Any means of payment that exists purely in electronic form. Digital money is not tangible like a dollar bill or a coin. It is accounted for and transferred using computers” (Investopedia, 2017).
- Electronic money: “An electronic store of monetary value on a technical device that may be widely used for making payments to entities other than e-money issuer. The device acts as a prepaid bearer instrument which does not necessarily involve bank accounts in transactions” (European Central Bank, 2017).
- Virtual currency scheme: “A digital representation of value, not issued by a central bank, credit institution or e-money institution, which in some circumstances can be used as an alternative to money” (European Central Bank, 2015).
- Hard currencies: “Stable, convertible currency such as the Euro, US dollar, Yen or that enjoys the confidence of investors and traders alike. Hard currencies serve as means of payment settlements because they do not suffer from sharp exchange rate fluctuations” (BusinessDictionary, 2017).
- Inflation: “When prices of goods and services are on average rising, inflation is positive. If enough prices fall, the average price may fall too resulting in negative inflation” (ING, 2017).

- Nominal interest rate: “A nominal interest rate is the interest rate that does not take inflation into account. It is the interest rate that is quoted on bonds and loans” (Nickolas, 2017).
- Opportunity cost: “A benefit, profit, or value of something that must be given up to acquire or achieve something else” (BusinessDictionary, 2017).
- Gross domestic product (GDP): “GDP is the final value of the goods and services produced within the geographic boundaries of a country during a specified period of time, normally a year. GDP growth rate is an important indicator of the economic performance of a country” (The Economic Times, 2017).
- Hyperinflation: “A very high rate of inflation, especially sustained over a long period of time” (The financial dictionary, 2012).
- Market economy: “A capitalistic economic system in which there is free competition and prices are determined by the interaction of supply and demand” (Dictionary.com, 2017).

## Chapter 2: The monetary system

- Clearing house of commerce: “Affiliated agency or a facility operated by banks within a geographical area to act as a central site for collection, exchange, and settlement of checks drawn on each other” (BusinessDictionary, 2017).
- Joint stock bank: “A bank which is a public company with shares owned by investors rather than a government” (Financial Times, 2017).
- Public choice theory: “Public choice theory argues that economic self-interest is the driving force of politics” (Mariotti, 2015).
- The gold standard: “Gold standard can refer to several things, including a fixed monetary regime under which the monopoly government currency is fixed and may be freely converted into gold” (Investopedia, 2017).
- Monetary policy: “Monetary policy is the macroeconomic policy laid down by the central bank. It involves management of money supply and interest rate and is the demand side economic policy used by the government of a country to achieve macroeconomic objectives like inflation, consumption, growth and liquidity” (The Economic Times, 2017).

- Policy interest rate: “The policy interest rate is an interest rate that the monetary authority (i.e. the central bank) sets in order to influence the evolution of the main monetary variables in the economy such as interest rates” (Focus Economics, 2017).
- The interbank rate: “The interbank rate is the rate of interest charged on short-term loans made between banks” (Investopedia,2017).
- Exchange rate: “Price for which the currency of a country can be exchanged for another country’s currency” (Business Dictionary, 2016).
- Free rider problem: “The free rider problem is a market failure that occurs when people take advantage of being able to use a common resource, or collective good, without paying for it, as is the case when citizens of a country utilize public goods without paying their fair share in taxes” (Investopedia, 2017).
- Balance of payments: “The balance of payments is the record of all international financial transactions made by a country's residents. A country's balance of payments tells you whether it saves enough to pay for its imports” (Amadeo, What is balance of payments? Components and deficit, 2017).
- Balance of trade: “The balance of trade compares the value of a country's exports of goods and services against its imports. When exports are greater than imports, that's a trade surplus” (Amadeo, Balance of Trade: Favorable vs Unfavorable, 2017).

### Chapter 3: Alternatives:

- Cryptography: “The computerized encoding and decoding of information; the process of writing or reading secret messages or codes” (Merriam-Webster, 2017).

## Executive Summary

According to the International Monetary Fund, 145 banking crises, 208 monetary crashes and 72 sovereign-debt crises have occurred between 1970 and 2010 (Lietaer, Arnsperger, Goerner, & Brunnhuber, 2012). Crises have a negative impact on employment, human and social costs and production, and ultimately taxpayers are left to pay the bill. The most recent example is the 2007-2008 sub-prime banking crisis that affected countries such as Great Britain, Germany, the United States and Belgium. Another concern of modern society is the growing inequality in the world. Indeed, the world's eight richest persons possess as much wealth as the poorest 50% of the world population (Elliott, 2017). This leads to social tension and insecurity in many countries.

Based on several research studies, we figured out that money and the monetary system play an important role in the world economy. Therefore, we decided to make money the subject matter of our thesis.

The economy will not be able to deal with another major crisis as humanity faces major challenges in the coming decades such as climate change and retiring baby boomers. In order to achieve an "after CO<sub>2</sub>-economy", massive investments will be needed fuelled by government subsidies and tax breaks. Retiring baby boomers will increase health expenses and put the pension system of many countries in great difficulty. To face these challenges, a well-functioning monetary and economic system is indispensable.

The current monetary system was essential during the industrialisation transition because of its rapid and massive economic growth. However, the multiple drawbacks like short-term vision, deterioration of social connection and community, need for endless growth, inequalities of wealth concentration, pro-cyclical tendency of money creation, and flow of the current monetary system show us that it does not address the challenges of today's world and enlightens its limitations.

According to Bernard Lietaer, the main issue of the monetary system is "the monopoly of a single type currency created by the banking system through loans attached to positive interest rates [debt]" (Lietaer, What is the problem with our current money system, 2010). It is not flexible enough and is only adapted for transactions in the classic sectors and between conventional economic agents. Complementary currencies are an alternative that could deal with some of these shortcomings as they are usually not driven by positive interest rates but

tend to encourage cooperation between people. They would also allow people to complete transactions that benefit everyone while eliminating the competitive aspect. Moreover, it would make the current monetary system more stable as it would rely on several currencies which are better adapted to certain type of transactions and which will open up the monetary system to organisation outside of a small group of financial institutions who currently seels the monetary system (Lietaer, What is the problem with our current money system, 2010). It would end the monoculture and make space for a system with multiple currencies which each have a different finality. Finally, these complementary currencies would give more importance to the cooperative economy which nowadays relies mainly on the subsidies received from the competitive economy, fuelled by its scarce currency attached to positive interest rates.

Another type of alternative to the current monetary system is cryptocurrencies and its blockchain technology. The blockchain technology is a disruptive technology in the financial world in the sense that people make (international) transactions without using traditional financial institutions. Nowadays, some banks can show abusive traits due to their close connection to the political world. Introducing an apolitical cryptocurrency technology could help create a neutral and free currency market (Scott, 2016). However, it is important to stress out the fact that cryptocurrencies are facing multiple shortcomings mainly related to their high volatility and speculative traits which will have to be fixed to become a viable and sustainable alternative to the current financial system.

Finally, we have addressed the feasibility to combine both concepts leading to complementary currencies supported by the blockchain technology. This idea aligns with the belief of Professor Diniz who sees digitalisation as an important factor in the implementation of complementary currencies. Digital complementary currencies offer multiple advantages that can boost their expansion and growth. The main objective is to reduce the costly and cumbersome management of complementary paper currencies. Even though initiatives related to complementary cryptocurrencies are still in their early stages, they confirm the trend that complementary currencies supported by the blockchain technology are technically feasible. These could also take advantage of the blockchain technology that is nowadays mainly used for speculative behaviors like Bitcoin. However, it is important to mention that the success of complementary currencies depends on the issue they want to tackle and the community in which they will circulate. Therefore, using the blockchain technology or even digital currencies will not always be adequate. A main example of this is the Toreke project in Ghent where the introduction of a digital currency was a failure.

Even though complementary currencies are still in an “early adopter” phase, the awareness around them is expanding. However, we believe that a bigger interest from the economic agents of the actual monetary system such as commercial banks, central banks and the political world is needed in order to develop them even more. Some examples already exist with the Banco Palmas initiative where commercial banks, central bank and the government are part of the project or the involvement of the European Commission with the D-Cent project. These few examples allow us to believe that major players start to see the benefits of complementary currencies which will play a more important role in our economic and monetary system in the near future.

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## Introduction

According to the International Monetary Fund, 145 banking crises, 208 monetary crashes and 72 sovereign-debt crises have occurred between 1970 and 2010 (Lietaer, Arnsperger, Goerner, & Brunnhuber, 2012). Crises have a negative impact on employment, human and social costs and production, and taxpayers are left to pay the bill. The most recent example is the 2007-2008 banking crisis that affected countries such as Great Britain, Germany, the United States and Belgium. The affected countries represented more than 50% of the gross world production and several countries are still dealing today with enormous consequences. Another concern of modern society is the growing inequality in the world. Indeed, the world's eight richest persons possess as much as the poorest 50% of the world population (Elliott, 2017). This leads to social tension and insecurity in many countries. All of those problems led us to reflect why they are occurring and how they could be avoided. Based on several research studies, we figured out that money and the monetary system play an important role in the world economy. Therefore, we decided to make money the subject matter of our thesis.

The economy will not be able to deal with another major crisis as humanity faces major challenges in the coming decades such as climate change and retiring baby boomers. In order to achieve an "after CO<sub>2</sub>-economy", massive investments will be needed fuelled by government subsidies and tax breaks. Retiring baby boomers will increase health expenses and put the pension system of many countries in great difficulty. To face those challenges, a well-functioning monetary and economic system is indispensable. This leads to one of the main questions of this thesis: Is the current monetary system still viable and adequate for the challenges ahead? To determine this, the current monetary system and its main pillars will be discussed before analysing its main advantages and disadvantages. We will conclude this chapter with a perspective that will initiate the next chapter with the question: What are the alternatives? If alternatives are welcome, we will describe them and analyse their various advantages as well as potential disadvantages. However, before we can give an appropriate answer to those questions, we believe it is important to first understand the term *money* which will be defined in the first chapter of this thesis.

Throughout history, money has evolved to become what it is today. But do people really understand what the term *money* encompasses? Money is a pillar of the economy, a measurement tool which facilitates exchanges. However, most people believe that there is only one type of money such as the euro, the dollar or the yen. As we will see in this thesis, there are

many different types of money and their goal can greatly differ. Defining the term *money* in the first place will allow us to answer the next questions: What actually is money? How important is it nowadays? Indeed, money is taken as granted in society but do people really understand its functionality, its ultimate goal and more importantly, its implications? In this first chapter, we will tend to shed light on this complex term *money*.

Then, after an analysis in the second chapter of the current monetary system, we will discuss in chapter three the potential improvements to the current system. Two main concepts will be reviewed: complementary currencies and cryptocurrencies. Both currencies offer interesting adjustments that could help face the two main challenges. We will continue with an analysis of the impact of a combination of both types of currencies on the monetary and economic system.

Finally, a field research will be done in locations where complementary currencies have already been implemented, such as the Toreke in Ghent. We strongly believe that inside information from people using such currencies is crucial to determine the real impact on the economy, the economic agents and the fundamental function of these complementary currencies. This will help us determine if complementary currencies are truly a possible solution to some of the current monetary and economic problems.

During our research, we faced one major challenge. The topic of our thesis was so vast and complex that we found it difficult to express our ideas and remain succinct at the same time. However, by focusing on the most important aspects of the questions raised in our research, we were able to develop some concepts which could have a positive effect on the monetary and economic systems.

## Chapter 1: What is Money?

Nowadays, money is taken for granted but do people really understand what this term encompasses? “Money is a projection of the collective unconsciousness of a society” (Lietaer, *Au coeur de la monnaie: Systèmes monétaires, inconscient collectif, archétypes et tabous*, 2013). Money is accepted unconsciously, it is a given. In this chapter, the different components of money will be analysed and discussed. This is crucial because money plays such an important role in the economy in general, and more particularly in economic phenomena such as inflation, interest rates and business cycles. All those phenomena affect people and their behaviour. Money plays a prominent role in today's economy. This is why it is important to first understand this term before delving into the heart of this thesis.

This chapter will first address the difficulty in defining *money*. The major types of money will then be explained, followed by the evolution and history of money. Finally, we will describe the different components of money, their impact on the economy and their connection to economic phenomena.

### 1.1 Definition

Coming up with a single definition for *money* is extremely difficult. There is no consensus among economists, whose definitions vary. The term *money* represents a broad and complex concept which is difficult to define accurately while covering all of its aspects. Money is in constant evolution which has an impact on its essence and therefore its implications and functions.

#### 1.1.1 Etymology of Money

The term *money* comes from the Latin verb *monere* which means “to warn”. The word refers to the temple of Moneta in Rome, where Juno – the admonishing goddess, advising and warning Romans – was worshipped, and where metal coins were also minted. The connection between these two origins is based on the Roman legend that the Moneta temple was built where geese from the Capitol warned Rome of the Gallic invasion during the 4<sup>th</sup> century BC. After that, Juno was nicknamed *Moneta*, “who warns” and by association, so were the coins minted in her temple (Colmant, *Voyage au bout d'une nuit monétaire*, 2013).

### 1.1.2 Different Definitions of Money

Before we can address the history and origin of money, it is important to understand what money basically is. Looking at various sources, the definition of *money* varies greatly from one economist to the next. Therefore, we find it important to analyse and compare those definitions to try and form an accurate and complete definition of our own.

As a starting point, we have selected definitions based on several criteria, including author reputation and scientific or academic objectivity. We have also chosen to work with very different definitions in order to encompass as many aspects of money as possible.

As students of the Université Catholique de Louvain (UCL) we chose to start with Bruno Colmant, a Belgian economist and Professor at UCL. He describes *money* as both a stock and a flow (Colmant, Dette publique et monnaie, 2013). It is a stock provided by a central authority because it is basically possible to make it tangible through coins or banknotes. Money can also exist through its own flow which is created by commercial banks through deposits and credits (Colmant, Une nouvelle politique budgétaire est indispensable, 2016); it would otherwise lose its fundamental purpose, its transactional function (Colmant, Dette publique et monnaie, 2013). Professor Colmant also states that money can only survive as long as it gathers enough believers around it because the value of money mainly depends on the trust people place in it (Colmant, La monnaie et Jésus-Christ, 2016). Finally, Professor Colmant emphasises the transactional role of money since it allows barter to be replaced with an intermediary good (Colmant, La monnaie créée de toutes pièces..., 2014).

Bernard Lietaer is also a Belgian economist with more than 30 years of experience in various positions in finance, and particularly in the design and implementation of currency systems. He defines *money* as “an agreement within a community to use something standardized as a medium of exchange” (Lietaer, The future of money: creating new wealth, work and a wiser world, 2001). According to him, the majority of economic sources define money by enumerating its functions (which are: standard of value, medium of exchange and store of value) instead of providing a clear and accurate definition. Money could be anything that people agree to exchange for goods or services. He further states the government’s only role is to give a value to an exchangeable instrument by requiring that this particular currency be used when paying taxes (Lietaer, Bernard Lietaer on the definition of money, 2012).

Another definition is provided by Investopedia, which is a frequently-used source of financial content. It defines *money* as “an officially-issued legal tender;<sup>1</sup> generally consisting of notes and coins, and is the circulating medium of exchange as defined by a government. [...] a liquid asset used in the settlement of debts that functions based on the general acceptance of its associated value within an economy. The value of money is not necessarily derived from the materials used to produce the note or coin and, instead, derives based on the amount shown on its face combined with the public’s willingness to support the value as displayed” (Investopedia, 2017). In this broad definition, money is a legal tender whose value is derived from people’s faith in this payment instrument and in the government supporting it. According to Investopedia, money can therefore only be issued by governments. In essence, the value of money is derived from the trust people place in the central institution which issues the money rather than the material from which it is made.

A different approach comes from Augusto Graziani (Graziani, 1989), an Italian economist who has studied monetary systems for many years. He makes a distinction between commodity money and token money as follow:

- Commodity money is a sort of currency which can be produced by anyone, such as gold. The value of the commodity derives from what it is made of. He finds this currency suitable for a barter economy.
- Token money is a sort of money which represents a higher value than its intrinsic value, i.e. the value of the materials from which it is made (Pettinger T. , 2013). The value comes from the faith that people put in it which is related to the confidence they have in the central authority issuing it and the law of supply and demand. Banks started to issue this kind of payment – which could be converted afterwards into commodities such as gold – so that people did not have to carry these commodities with them. Token money is related to the concept of *fiat money* which is a currency declared to be a legal tender and backed by a government rather than a physical commodity.

In today’s economy, it is relevant to analyse the definition of *money* given by the European Central Bank (“ECB”). According to the ECB, the essence of money has changed over time and has evolved from commodity money to electronic money,<sup>2</sup> such as money on a bank

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<sup>1</sup> Any official medium of payment recognized by law that can be used to extinguish a public or private debt, or meet a financial obligation (Investopedia, 2017).

<sup>2</sup> Electronic store of monetary value on a technical device that may be widely used for making payments to entities other than the e-money issuer (European Central Bank, 2017).

account.<sup>3</sup> However, its functionality has remained the same. It is 1) a medium of exchange, 2) a medium to store value, and 3) a unit of account (European Central Bank, 2015).

### 1.1.3 Attempt to Form a Definition

After these different definitions and descriptions, it seems correct to conclude that there is no single definition of *money*. A fundamental aspect of money is clearly that it can serve as “a medium of exchange”. This applies to different types of money such as commodity money, representative money, token money and fiat money (see next part). The definition of Investopedia seems to leave no space for money that is not issued by a government or central authority. The definition of Lietaer can be applied when dealing with complementary currencies (which will be described in depth in this thesis) as they do not need to be supported by governments or central authorities but rather by communities which are decentralized authorities. Cryptocurrencies are also a type of decentralized money as they are not issued by central banks or authorities. The definition from the ECB is also useful as it refers to the various physical or digital representations of money. Another fundamental aspect of money is its dual nature (stock and flow) as identified by Professor Colmant. These characteristics are not mentioned in the definition of Bernard Lietaer.

The above definitions generally agree on the functions of money. These functions are: 1) money as unit of account, 2) money as a medium of exchange, and 3) money as a medium to store value. A fourth function derived from functions 1 and 3 – money as a unit of account and money to store value – is money as a way to defer payments.

The transactional role of money as explained by Professor Colmant (Colmant, *La monnaie créée de toutes pieces*, 2014) is of high importance in our thesis, in particular when combined with the definition of Mr. Lietaer where money is “an agreement within a community to use something standardized as a medium of exchange”. In this thesis, we will define *money* as “a standardised item, either digital or tangible, which is both a flow and a stock, trusted by people from a community, who agree to use it as a medium of exchange in their transactions”.

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<sup>3</sup> The different types of money will be explained and defined in the next part of this thesis.

#### 1.1.4 Currency

Now that the term money is defined, we must compare the term *money* with the term *currency* as these are used interchangeably in multiple sources. However, many authors and economists have different views on the definition of currency.

On the one hand, the term *currency* is defined as “a generally accepted form of money, including coins and paper notes, which is issued by a government and circulated within an economy. Used as a medium of exchange for goods and services, currency is the basis for trade” (Investopedia, 2017). This definition is somewhat unfortunate because it does not consider currencies that are not issued by a central authority, which question whether or not a currency can exist without it being issued by a central authority will be described later on. According to this definition, a currency may take other forms than coins and paper notes, such as deposits. Therefore, many economists believe that currency and money are synonyms, with *currency* emphasising money as a medium of exchange (Lietaer, Glossary, 2010).

On the other hand, authors such as Mike Maloney make a clear distinction between currency and money. In his view, the term *currency* encompasses all the features of money except for one which is “a long-term store of value”. Nowadays, since governments can print currency which is not backed by any commodity – i.e. fiat currency – but solely on a confidence basis, an excessive printing can destroy the value of a currency. Fiat currencies always tend to return to their intrinsic value which is zero (Maloney, Money vs currency - Hidden Secrets of Money Ep1, 2013). Therefore, currency cannot fulfil one of the most important characteristics of money which is a long-term store of value.

The difference between money and currency being so limited for the majority of the economists, we will use both terms indiscriminately in this thesis.

#### 1.1.5 Defined Terms for the Rest of this Thesis

To maintain clarity in this thesis, we have to agree on some defined terms. First, the terms *currency* and *money* will be used interchangeably as they refer to the same concept. Second, the term *money* will represent a standardised item, either digital or tangible, which is both a flow and a stock, trusted by people from a community, who agree to use it as a medium of exchange in their transactions. Finally, the term *money* used alone will refer to fiat money.

## 1.2 Major Types of Money

Throughout history, many different types of money have been developed or issued. Before we address the history and evolution of money, we will describe its various types.

### 1.2.1 Commodity Money

The earliest type of money was commodity money (European Central Bank, 2015). Its value was rooted in its intrinsic value. People went from bartering to exchanging their goods for a (tradable) commodity. The value of the currency was backed by the commodity to which it was related (Lietaer, Glossary, 2010). Gold, jewellery, silver, metal coins and tea were some of the major commodity currencies used early on because of their intrinsic value.

A positive feature of commodity money is that it is a safe asset. Nowadays, gold is still highly valued and people turn to it especially in times of crisis or turmoil. The price of gold increases during economic downturns as people will be more likely to go for “safe haven assets”<sup>4</sup> (Palmer, 2016).

Nevertheless, there are also some disadvantages. First, dividing a bar of gold into smaller pieces is much more difficult than paper money and requires specialist expertise (Bass, 2011). Also, commodity money is subject to the so-called *jump on the bandwagon effect*:<sup>5</sup> when the price of a commodity like gold goes up, people irrationally believe that it is time to buy it. Therefore, the price of a commodity can increase and decrease following a speculative trend which is not caused by the demand linked to the actual use of gold in the industry, as in jewellery (which represents only a fraction of the stock of gold). If everyone suddenly decided that gold had no value (no more demand), then gold would lose its entire value (Bass, 2011). Deterioration and bulkiness are other drawbacks (The Ohio State University, 2002). Some commodities can deteriorate over time unlike paper money that can be reprinted or even digital money which has no physical representation. Also, commodities can sometimes be difficult to use for payments that involve very small or very big amounts.

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<sup>4</sup> A safe haven is an investment that is expected to retain its value or even increase its value in times of market turbulence (Investopedia, 2017).

<sup>5</sup> The bandwagon effect is a psychological phenomenon in which people do something primarily because other people are doing it, regardless of their own beliefs, which they may ignore or override (Investopedia, 2017).

### 1.2.2 Representative Money

Representative currencies are banknotes that are backed by silver or gold. As a result, each unit of currency is convertible into an equal amount of gold or silver held by the issuing central bank (European Central Bank, 2015). Therefore, a central bank can theoretically only issue an amount of representative currency equal to the amount of gold or silver held by the government. One of the main functions of this type of currency is thus its convertibility. Before 1971, the US dollar was a representative currency. People could go to the Federal Reserve Bank and exchange one dollar into one dollar's worth of gold (Investopedia, 2017). Representative money offers solutions to the drawbacks of commodity currencies because it is easily divisible and very durable. This type of money represents a transition between commodity money and fiat money. The level of trust in representative currencies highly increased while the intrinsic value decreased. The evolution from trade to commodity money and then to representative money has greatly simplified business and led to an increased division of work (Colmant, *La monnaie créée de toutes pièces...*, 2014).

### 1.2.3 Fiat Money

In 1971, fiat money became a fact of life when President Nixon declared that the US dollar could no longer be converted into gold. It signalled the end of the Bretton Woods Agreement (see Chapter 2) which was definitely buried in 1973 with the adoption of floating rates (Colmant, *Giscard et l'emprunt-or de 1973*, 2012). The dollar was no longer a representative currency but a fiat currency, which is a currency declared to be legal tender<sup>6</sup> by a government, issued by a central bank and not backed by any commodity. Its value derives from the law of supply and demand, and from the faith people have in the stability of the government and economy of the country instead of the value of the material it is made of (Investopedia, 2017). Fiat money is thus only created by the power of an authority and is money actually created out of nothing (Lietaer, *Glossary*, 2010). Professor Colmant stresses out the actual and horrifying vacuity behind money that only lasts as long as it gathers enough believers (as for God?) (Colmant, *Des monnaies et des Dieux*, 2012). The connection is even made by the fact that fiat money comes from *fiat lux* which means "light came" (Colmant, *Que signifie le "money fiat"?*, 2013). The euro, the dollar and the yen are some examples of fiat money.

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<sup>6</sup> Legal tender is any official medium of payment recognized by law that can be used to extinguish a public or private debt, or meet a financial obligation (Investopedia, 2017).

### 1.2.4 Different Representations of Money

Throughout history, the physical representation of money was either paper or coins. Today, many currencies do not possess any tangible representation anymore. The best example is digital money<sup>7</sup> such as bank money or electronic money<sup>8</sup> (European Central Bank, 2015). Bank money is the money credited to a bank account which can be wired from one account to another. One account is *debited*<sup>9</sup> and another account is *credited*.<sup>10</sup> The most recent type of money is a *virtual currency scheme*<sup>11</sup> like Bitcoins, which is not controlled by any central authority such as a central bank (European Central Bank, 2015). This concept will be discussed in more details in chapter 2.

Several types of money with different representations are used in the current economy. Paper money, coins, electronic money and digital currencies are all used by economic agents depending on the type of transaction.

## 1.3 Evolution of Money

Money has evolved throughout human history and has taken many different forms. However, the fundamental essence of money has remained a “medium of exchange”. Money is an essential element of an economy. It is important to have an overview of the evolution of money in transactions between people over the ages. This will help understand the different monetary systems. We will also identify the main goals and the context of the successive monetary systems. Monetary systems will be reviewed in more details later in this thesis.

The history of money is characterised by several periods during which money changed forms. This evolution was caused by the changing economic context and by certain policy decisions that were taken.

It all began around 9000 BC when people started to trade between them the objects they wanted or needed. They would usually exchange goods they had in surplus for goods they desired (Burn-Callander, 2014). The barter economy was born. In this economy, there was no common

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<sup>7</sup> Any means of payment that exists purely in electronic form. Digital money is not tangible like a dollar bill or a coin. It is accounted for and transferred using computers (Investopedia, 2017).

<sup>8</sup> An electronic store of monetary value on a technical device that may be widely used for making payments to entities other than e-money issuer. The device acts as a prepaid bearer instrument which does not necessarily involve bank accounts in transactions (European Central Bank, 2017).

<sup>9</sup> Money is taken from the bank account.

<sup>10</sup> Money is added to the bank account.

<sup>11</sup> A digital representation of value, not issued by a central bank, credit institution or e-money institution, which in some circumstances can be used as an alternative to money (European Central Bank, 2015).

medium of exchange. Rather, it was an agreement between two parties about the goods they would trade. Therefore, barter goods could be anything that both parties agreed upon. Today, bartering is still used and appreciated. The creation and evolution of money does not mean that previous types of exchanges are disappearing. In the United States for example, the barter economy is still worth 12 million dollars in goods and services every year (Spitznagel, 2012).

However, barter trade is not the most efficient one. First, bartering can be difficult, for example when a person wants to acquire a small item and their only medium of exchange is cattle, which cannot be divided into smaller pieces. Trade is also sometimes impossible, for example when the counterparty is not interested in the goods offered in exchange (BNP Paribas, 2016). Finally, problems can arise with big amounts, as it is difficult to transport and exchange numerous items for a large transaction (Fondation canadienne d'éducation économique (FCEE), 1994).

These drawbacks led to the conception of new exchange tools. People started using means of exchange (like salt) which are easier to stock, directly usable and valuable (BNP Paribas, 2016). These exchangeable commodities are called primitive currencies. Salt was particularly appreciated by merchants and widely accepted in the Roman Empire. It was extremely common for a Roman soldier to be paid in salt, which is actually the origin of the word *salary*. Primitive currencies meet the main characteristics of money as a medium of exchange and payment, a factor of wealth and measurement of value. Other benefits include the fact that they are widely accepted, smaller in size, and durable (Banque Nationale de Belgique (BNB), 2012). This represents a transition phase between a pure barter economy and an economy based on more standardised means of payments.

Traces were found in China going back as far as 1100 BC of people using small bronze replicas of goods to exchange products in their economy. The benefits of this new concept in trade were already known in regions around the Indian Ocean in 1200 BC (Burn-Callander, 2014).

Currency made of precious metal appeared in 650 BC (BNP Paribas, 2016). In 600 BC, the first “official” currency was introduced under the reign of King Alyattes in Lydia (now Turkey). This standardised medium of exchange allowed trade to flourish in regions around the Mediterranean Sea. The initial purpose of currencies seemed to have been to satisfy the ego of cities and their rulers who were portrayed on the coins. It led however to additional and more relevant benefits, such as easier exchanges of products and it favoured trade in general (Burn-Callander, 2014).

These currencies, backed by the King or a group of merchants, facilitated trades as the medium of exchange was predictable, safer and easier to use (Castillon, 2016). This type of currencies became an essential part of the expansion of empires such as the Greek and the Roman empires.

Around the 5<sup>th</sup> century BC in Ancient Greece, gold and silver coins were widely used. The Athenian owl (Greek empire) was the most international currency of that time (Banque Nationale de Belgique (BNB), 2012) and, as it was accepted abroad, it was used to trade between countries. It allowed economic activity to expand and an international trade market to grow. Before that, money was only accepted in its country of origin and not abroad (Fondation canadienne d'éducation économique (FCEE), 1994). It is particularly interesting to draw the parallel with our times. The level of acceptance of people of a currency is intimately connected to the economic power of the issuing country. The US dollar, issued by the central bank of today's largest economic power, can be compared to currencies of superpowers from the past, the Greek and Roman empires (Fondation canadienne d'éducation économique (FCEE), 1994).

Ancient empires created their own money to facilitate exchanges and unify their territories (BNP Paribas, 2016). Two interesting concepts were introduced in the Roman empire. As a first step, Emperor August introduced the *trimetalism*.<sup>12</sup> Only coins made of gold (aureus), silver (silver denier) and bronze (sesterces) could be used. An aureus was more valuable than a silver denier which was more valuable than a sesterce. Later, the *monometalism*<sup>13</sup> was introduced by emperor Constantin in the beginning of the 3<sup>rd</sup> century AD. Gold was the only currency and was called the *solidus* (Castillon, 2016).

From the 11<sup>th</sup> century on, many lords and cities in Europe minted their own currencies such as the florin, the franc or the thaler (Banque Nationale de Belgique (BNB), 2012). The thaler, which was the first international currency, was first launched by the German Emperor Ferdinand I in 1559. In 1750, the Empress Maria Theresa minted another thaler with her portrait on the front. This coin was used as far as in the Spanish colonies (Burn-Callander, 2014).

Paper money was invented in Mongolia under the reign of Kublai Khan (1214-1294). Europeans discovered the benefits of the concept of paper money through the travels of Marco Polo. Paper money such as deposit certificates, ancestors of the bank notes, was introduced in the Middle Ages and was exchangeable into metals or other valuable objects (Banque Nationale de Belgique (BNB), 2012).

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<sup>12</sup> A system with three metallic coins as currency.

<sup>13</sup> A system with a single metallic coin as currency.

In 1656, a private bank called Stockholms Banco located in Stockholm received the authorization to grant loans. In 1661 to finance its lending business it issued the first bank note called the *kreditivsedlar* which could be converted into copper. These bank notes were not entirely backed by metal deposits and were also relying on the trust people placed into the bank (Banque Nationale de Belgique (BNB), 2012).

In 1860, Western Union launched the electronic fund transfer via telegram (Burn-Callander, 2014). Over time, money changed forms to match economic development and technological progress. Nowadays, different forms of dematerialised money have appeared such as bank money and electronic money (Banque Nationale de Belgique (BNB), 2012). The first credit card was introduced by John Biggins in 1946 (Burn-Callander, 2014).

New trading tools are still being introduced today, like smartphones applications. The most recent type of money is the *virtual currency scheme* which includes Bitcoins (European Central Bank, 2015).

From this historical overview, we can see that a currency must have two closely related features to be successful: the *level of trust* people place in the currency and its *intrinsic value*. At first, people only relied on the intrinsic value of the currency, i.e. exchangeable objects (barter economy). Then, primitive currencies were used when their benefits became clear to traders. With the introduction of precious metal currencies, it became easier for people to agree on their underlying value, which boosted the level of trust in these currencies (commodity currencies). The introduction of paper currencies was a next step in the decrease of the intrinsic value of currencies and the increased importance of the level of trust. The currencies became closer to fiat money. Fiat money is in fact the complete opposite of barter. In fiat money, the level of trust is at its maximum when the intrinsic value is at its lowest level, whereas in barter, the value derives exclusively from the intrinsic value of the exchanged goods.

In conclusion, the reason fiat money did not appear earlier in history is because there was a lack of trust. The level of trust needed for fiat money has taken a long time to materialise (Fondation canadienne d'éducation économique (FCEE), 1994).

#### **1.4 Functions of Money**

The main function of money in an economic system could be explained as follow: “to facilitate the exchange of goods and services and help in carrying out trade smoothly” (Singh J. , 2016). In a mature market, money has the following functions: 1) money as a medium of exchange, 2)

money as a unit of account or measure of value, 3) money as a means to store value, and 4) money as a standard of deferred payments which is derived from money as a store value and money as unit of account.

#### 1.4.1 Money as a Medium of Exchange

The circulation of money is closely related to the circulation of goods and services. When a service or good is passed from the seller to the buyer, money passes from the buyer to the seller. The intermediary role of money in the trade of goods and services precisely represents the function of money as a medium of exchange. To fulfil a trade, money is indispensable.

Before money was implemented, barter was the only way to exchange goods and services. There was no clear separation between the act of purchasing and the act of selling. The primary function of money as a medium of exchange removed the inconvenience of a barter economy (Singh J. , 2016). Later, gold or silver ingots were used to exchange goods and services. Still, the economic agents faced some difficulties. Ingots needed to be weighed and fragmented. Those difficulties led agents to try and find an easier way to trade and ingots were complemented by coins. Those coins were made out of a specific type of metal, had a specific weight, and received a pre-determined value which was used as medium of exchange. Minting was managed by the State.

In the process of circulation, the value of money can fluctuate. The practice of monetary circulation shows that coins keep their nominal value over time. The nominal value of *used coins*<sup>14</sup> equals the nominal value of newly issued coins. This can be explained by the fact that money plays a temporary role in its function of medium of exchange. As a general rule, a person sells a good or service in exchange for money which will be used to buy another good or service. Consequently, money as a medium of exchange does not necessarily have an intrinsic value.

When they witnessed that used coins were in circulation, governments started to deliberately depreciate money and thus decrease its intrinsic value by reducing the percentage of gold or silver in their coins without changing their nominal value. Coins increasingly became a symbol of value. The intrinsic value of money became smaller than the nominal value (Meeus, 2016).

“To be accepted by all, a medium of exchange should have a stable purchasing power. Therefore, it should have the following characteristics: 1) Measurement of the value of assets;

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<sup>14</sup> Coins that are already in circulation.

2) Constant utility; 3) Low cost of preservation; 4) Transportability; 5) Divisibility; 6) High Market value in relation to volume and weight; 7) Recognisability; 8) Resistance to counterfeiting” (Boundless, 2016).

#### 1.4.2 Money as a Unit of Account or Measure of Value

An essential function of money is to serve as a unit of account. To understand that function, it is important to first define a unit of account: *“a unit of account is a standard numerical unit of measurement of the market value of goods, services, and other transactions. Also known as a "measure" or "standard" of relative worth and deferred payment, a unit of account is a necessary prerequisite for the formulation of commercial agreements”* (Boundless, 2016). In other words, it is a measurement of value. Regardless of the money used, a unit of account must meet the following qualities:

- Divisible. It can be divided into smaller units without loss of value. If a euro is divided into two halves, the total value of the two halves still equals one euro. Likewise, if a bar of gold is divided into four parts, the four pieces together will equal the same value as the original bar. Moreover, divisibility should be easy to accomplish (Grimsley, Money as a Unit of Account: Definition, Function & Example, 2017).
- Fungible. One unit or piece must be viewed as identical to any other piece with no change in value. On the other hand, real estate, work of arts and diamonds are unique and thus not fungible (Grimsley, Money as a Unit of Account: Definition, Function & Example, 2017).
- Countable. It must have a specific size, measure or weight. Because it is countable, money is subject to mathematical operations. It allows an agent to calculate a potential profit, loss or debt (Grimsley, Money as a Unit of Account: Definition, Function & Example, 2017).

In today’s economy, almost everything is measured by reference to money, which means that money is seen as something valuable. This explains why money as unit of account is so important. A buyer and a seller will both measure the opportunity cost and determine if a good or service is worth buying or selling. This will also give consumers and producers a chance to compare the value of alternative purchases. Can a buyer find a similar good or service at a lower price? “Without a measure of value, there can be no pricing process. Without a pricing process, organised marketing and production is not possible. Thus, the use of money as a measure of value is the basis of specialised production” (Singh J. , 2016).

### 1.4.3 Money as a Store of Value

Economic agents can store wealth in terms of money for the future. “In order to act as a store of value, money must be able to be reliably saved, stored, and retrieved. Moreover, it must be predictably usable as a medium of exchange when it is retrieved” (Boundless, 2016). Being able to store wealth allows agents to transfer purchasing power from the present to the future. “Keynes places great emphasis on this function of money. Holding money is equivalent to keeping a reserve of liquid assets because it can be easily converted into other things” (Singh J. , 2016). Hence money should also be durable.

A simple example will show why durability is a fundamental element of money as a store of value. If wheat is used as a stored value, it would lose its value over time because at a certain point, it would no longer be usable. Wheat is not the only example; most goods lose their value over time. “People therefore normally wish to keep a part of their wealth in the form of money because savings in terms of goods is very difficult. This desire is known as liquidity preference” (Singh J. , 2016). However, the value of some goods such as paintings can increase with time.

### 1.4.4 Money as a Standard of Deferred Payments

This function can be partially linked with the previous ones “money as a store of value” and “money as a unit of account”. Indeed, “using money as a standard of deferred payments is a direct consequence of the unit of account and store of value functions of money. If money is the standard for current prices, then money can also be the standard for future payments based on the agreed or expected future prices. But for money to function as a deferred payment standard, it must retain value, it must also store value” (Encyclonomic, 2017). The principle behind this function is the ability for economic agents to buy now and pay later, which is the direct result of the functions mentioned above.

A good example of deferred payments is consumer credit. Most people cannot pay for the full amount of a television at once. Therefore, people will apply for a consumer credit and make several deferred payments in the future.

Deferred payments depend on interest rates and inflation. If the same example is used, someone buying a television and paying with deferred payments will pay more than the original price. If the purchaser takes out a consumer credit for 5,000 euro over a period of 12 months and the interest rate is 5%, the buyer will pay in twelve monthly instalments the sum of the amount in principal and interest. The buyer has to compensate the seller for the fact that he does not receive

his money straight away. It is considered a loss for the seller since he cannot invest his money elsewhere in the meantime.

Inflation affects the level of interest applied to the deferred payments. The seller needs to be compensated for inflation which results in a loss of value.

## 1.5 Money Supply

“Money supply (also known as “money stock”) is the entire stock of currency and other liquid instruments circulating in a country's economy as of a particular time” (Investopedia, 2017). Money supply can be measured differently depending on what it included. Economists measure money supply in several ways because there are other forms of currencies than coins and paper money – also called hard currencies<sup>15</sup> – in an economy. These include checking and savings accounts, traveller’s checks, certificates of deposits (CDs), negotiable orders of withdrawal, money market instruments and more. While hard currency is called *cash*, these other forms are called *near cash* because they can easily be turned into cash. “Liquidity is the term used to describe how easy it is to convert assets to cash” (Singh R. , 2015). Another way to understand liquidity is how easy it is to buy and sell securities. When this near cash money is added to hard currencies, the total increases significantly. But because some forms of near cash are more liquid than other, economists use different calculation techniques depending on which form of currencies they are analysing. Since there is no single measure, the amount of money supply in an economy varies depending on which measure is used.

### ➤ Different measures of money

- *M0* is the narrowest definition of money supply and includes hard currencies in circulation and liquid or cash assets within a central bank (Investopedia, 2017).
- *MB* stands for *Monetary Base* and includes notes and coins (hard currencies) that are in the hands of the public and commercial bank deposits in the central bank. The Monetary Base (also called the “money base”) is highly liquid which means that the assets are easily convertible into cash. It is important to note that the terms “monetary base” and “money supply” are different. The monetary base is part of the money supply (Pettinger T. , Monetary Base Definition, 2016).

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<sup>15</sup> Stable, convertible currency such as the Euro, US dollar, Yen or that enjoys the confidence of investors and traders alike. Hard currencies serve as means of payment settlements because they do not suffer from sharp exchange rate fluctuations (BusinessDictionary, 2017).

- *M1* is a common measure of money supply which includes hard currencies in circulation (*M0*) plus checking accounts and some other checkable deposits. Checking accounts are technically out of circulation but the owner can retrieve them from the bank upon request. *M1* is one of the smallest, narrowest, most liquid measure of the money supply (OpenStax College, Economics, 2016).
- *M2* includes all of *M1* (cash and checking accounts deposits) plus near money, i.e. savings accounts, money market accounts and CDs of less than USD 100,000. This near money is not as liquid as cash and checking accounts but can quickly be converted into cash. As the name suggests, *M2* is a broader classification than *M1* as it includes highly liquid assets that are not cash, but can easily be converted into cash (Investopedia, 2017). *M2* is the section of the money supply used by economists to analyse and predict inflation.<sup>16</sup>
- *M3* includes larger deposits, institutional money market funds and other larger liquid assets. Those assets are less liquid than the assets included in *M1* and *M2*, which means that they are more difficult to convert into cash (Forex4you, 2017).

## 1.6 M1 Money Demand

*M1* money is an asset class composed of the financial assets that have a modest positive nominal rate.<sup>17</sup> No economic agent would have any economic interest in holding his assets in the form of *M1* money if it was not necessary for his transactions. Therefore, *M1* money demand depends on two determinants: the value of transactions and the interest rate level.

### 1.6.1 Value of the Transactions

Economic agents need more money for their transactions, as the prices for goods and services increase. The value of transactions depends on two factors which are 1) the number of transactions, and 2) the price of each transaction.

For a given volume of transactions, increasing the price of the exchanged goods or services will lead to higher nominal expenses and thus an additional need for *M1* money.

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<sup>16</sup> When prices of goods and services are on average rising, inflation is positive. If enough prices fall, the average price may fall too resulting in negative inflation (ING, 2017)

<sup>17</sup> A nominal interest rate is the interest rate that does not take inflation into account. It is the interest rate that is quoted on bonds and loans (Nickolas, 2017).

## 1.6.2 Interest Rate Level

Economic agents will be less likely to hold their assets in the form of M1 money – rather than financial assets with higher returns – when the *opportunity cost*<sup>18</sup> of holding M1 money increases, meaning that the nominal interest rate offered on financial investments is high. This means that when nominal interest rates are high, agents will tend to invest in financial assets rather than keeping M1 money.

## 1.7 Impact of Money (Supply) on the Economy and Daily life

As mentioned previously, money is at the heart of the economic systems because all purchases and sales are done with money. We also showed that barter has decreased throughout history and is no longer a prominent medium of exchange in economies worldwide. Nowadays, people are confronted to direct or indirect monetary phenomena.

- Direct through economic actions. Consumers use money daily to acquire goods and services and also to receive money for their work.
- Indirect through economic and financial information. Money is related to the most important economic phenomena such as inflation, unemployment, recession, growth, consumption evolution, Gross Domestic Product (GDP)<sup>19</sup>. The measurement of that information assumes the existence of money (Delaplace, 2017).

### 1.7.1 Relationship between Money and Business Cycles

Specialists suggest that money plays an important role in generating business cycles, which means the increase and decrease of the Gross Domestic Product (GDP) and employment. To understand this relationship, it is important to first define the term *business cycle*. A business cycle refers to the fluctuations in economic activity that an economy experiences over a period of time. It consists of periods of economic growth called expansions, and periods of economic decline called contractions or recessions. During expansions, employment, production, sales and incomes can increase (not necessarily all elements). During contractions, the opposite occurs with a decrease in employment, production, sales and income (but not necessary all of them). The housing boom of the 2000s is an example of expansion while the great recession

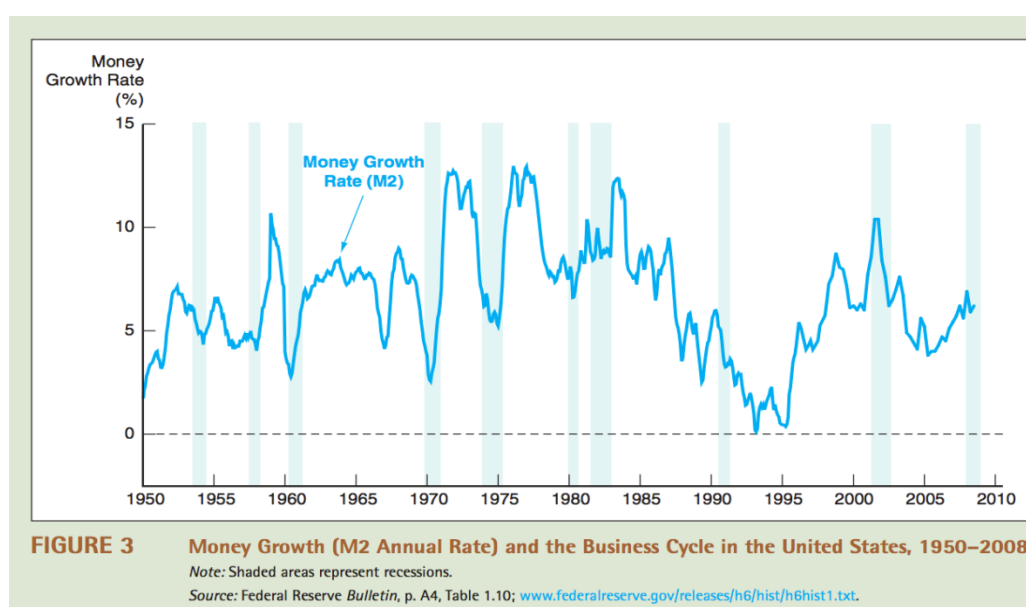
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<sup>18</sup> A benefit, profit, or value of something that must be given up to acquire or achieve something else (BusinessDictionary, 2017).

<sup>19</sup> GDP is the final value of the goods and services produced within the geographic boundaries of a country during a specified period of time, normally a year. GDP growth rate is an important indicator of the economic performance of a country (The Economic Times, 2017).

that followed, which technically lasted from December 2007 until June 2009, is an example of contraction. In the United States the National Bureau of Economic Research (NBER) is responsible for determining the official dates of business cycles in the United States (Investopedia, 2017).

The following graph shows the movements of the rate of M2 money growth, where the grey zones represent recessions. We can see that the rate of M2 money supply growth has decreased before every recession, which suggests that the variation of the offer of money can play a key role in the economic fluctuations and cycles. Nevertheless, not every decline in the rate of M2 money supply growth has been followed by a recession (Mishkin, 2013).



Source: (Mishkin, 2013).

This relation is even more difficult to observe in Europe. Also, business cycles are sometimes caused by external shocks. External shocks can be divided into two categories:

- Exogenous shocks which are unforeseeable and can happen at any time, like a terrorist attack, a hurricane (like Katrina), or an oil spill (like BP Horizon Gulf) (Gave, 2013).
- Endogenous shocks that are often the result of too much leverage, when agents borrow too much and hold too little collateral. Some examples of endogenous shocks are: Nasdaq at 5,000, subprime mortgages which led to the 2007 financial crisis, or real estate in Spain. Those endogenous factors can be predicted even if it is very complicated to forecast when they will occur (Gave, 2013).

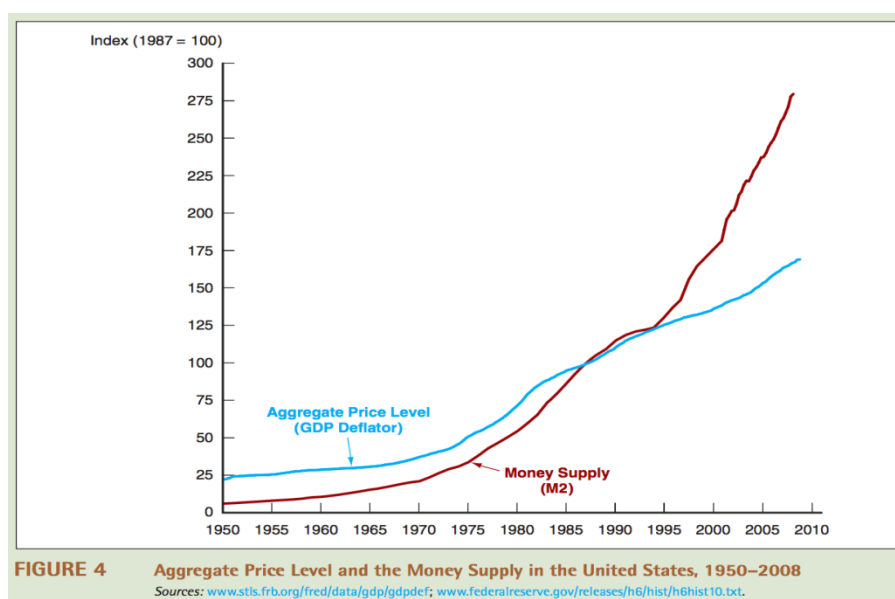
### 1.7.2 Relationship between Money and Inflation

“Inflation is the rate at which the general level of prices for goods and services is rising and, consequently, the purchasing power of currency is falling” (Investopedia, 2017). The impact of inflation on the fluctuation of the price of goods and services will lead to a change of behaviour by the consumer. Higher prices also erode the value of people’s savings and reduce their standard of living. Since inflation increases prices, one euro on a bank account today will have less value, i.e. purchasing power, in the future. An interesting example about inflation is the following: ten years ago, bread cost less than 0.50 euro in Belgium. Nowadays, the average price of bread is 2 euro. Prices have thus substantially increased during the past years, mainly because of inflation (Mishkin, 2013).

The next figure shows the evolution of the aggregate price level and money supply in the United States. The aggregate price level is simply the average price of goods and services in an economy. As we will observe, the aggregate price has increased more than six times between 1950 and 2010. To give an example closer to Belgium, the French aggregate price level has increased twelve times during the same period (Mishkin, 2013). As mentioned previously, a constant increase in price level is called inflation, and it affects everyone. An individual, a company and even a State will feel inflation. Inflation is considered an important matter, especially when it starts increasing strongly and leads to hyperinflation.<sup>20</sup> To control inflation, it is important to understand by what it is caused. As we can see in the graph below, the aggregate price level and the money supply tend to increase jointly which tends to indicate that money supply might be an important cause for inflation.

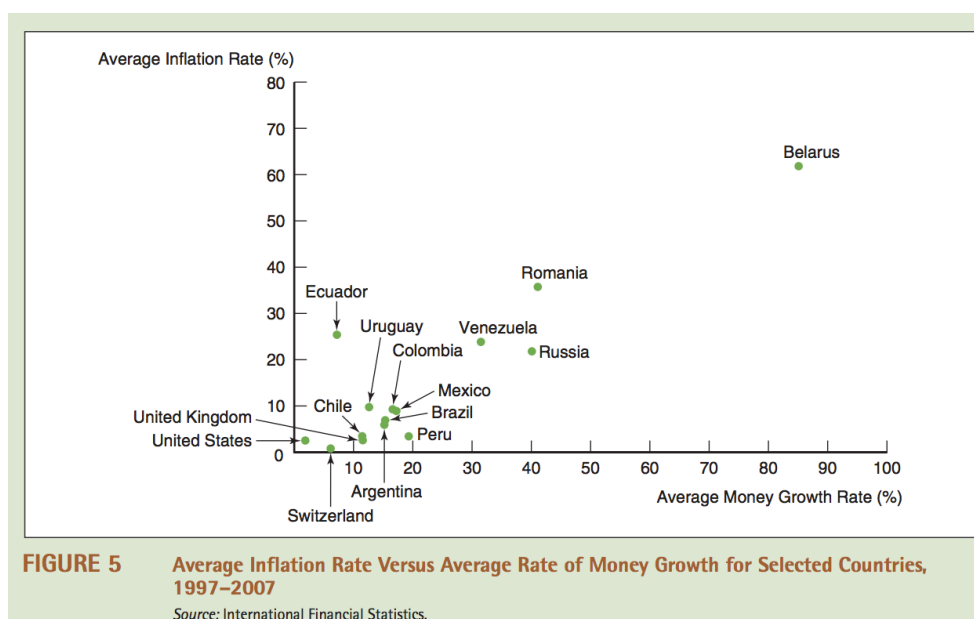
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<sup>20</sup> A very high rate of inflation, especially sustained over a long period of time (The financial dictionary, 2012).



Source: (Mishkin, 2013).

Another argument that supports the positive correlation between inflation and money supply increase can be found in the next graph, which displays the average rate of money supply growth and the average inflation rate over a period of ten years for a variety of countries. A relationship between inflation and the growth rate of money supply can be observed. Countries like Belarus, Russia, Brazil, show that the average inflation rate and their money supply growth rate are high, while countries like the United States and Great-Britain have a low inflation rate and a low money supply growth rate. We can therefore conclude from this graph that countries with the highest average inflation rate are also the countries with the highest money supply growth rate and vice-versa. This analysis had led Nobel Prize winner Milton Friedman to make the following statement: “Inflation is always and everywhere a monetary phenomenon” (Friedman, 1968).



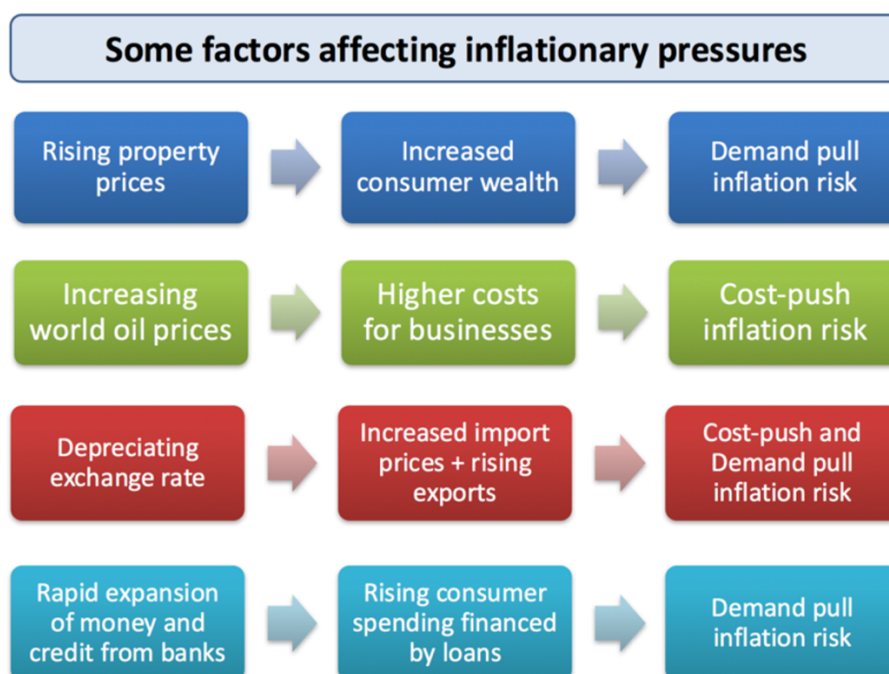
Source: (Mishkin, 2013).

Nevertheless, also other factors play an important role in inflation such as:

- Consumer confidence. Consumer confidence is boosted when unemployment is low and wages are not under pressure. This leads to an increase in the purchasing power of economic actors. Consumers will then spend more money on goods and services which means that the demand will increase. Based on the principle of supply and demand, producers will charge more for goods and services that are high in demand. The prices will thus increase (Investopedia, 2014).
- Decrease in supply. This factor is based on the previous one (consumer confidence) and once again the principle of supply and demand. When the demand increases, the available supply will logically decrease which means the price will increase for consumers. Consumers will be willing to pay more to obtain those goods or services. Consumer confidence is not the only cause of a decrease in supply. Exogenous shocks like natural disasters can decrease the supply and therefore increase the price. Last but not least, popularity can also play an important role (Investopedia, 2014).
- Corporate decisions. The actions and decisions of a company can be correlated with inflation. Companies like Apple that make popular items will increase their price when consumer demand is high. Companies that produce essential goods such as oil and gas can also increase their price. Even though corporations might not intend to cause inflation, their actions can have an impact. For example, if the price of cow feed increases, farmers might decide to thin their number of cattle to save some money. This

would lead to a decrease in the meat supply and the price would go up, leading to inflation (Investopedia, 2014).

The list of factors goes on (see graph below) and these multiple sources are the reason why inflation is so difficult to control.



Source: (Riley, 2015).

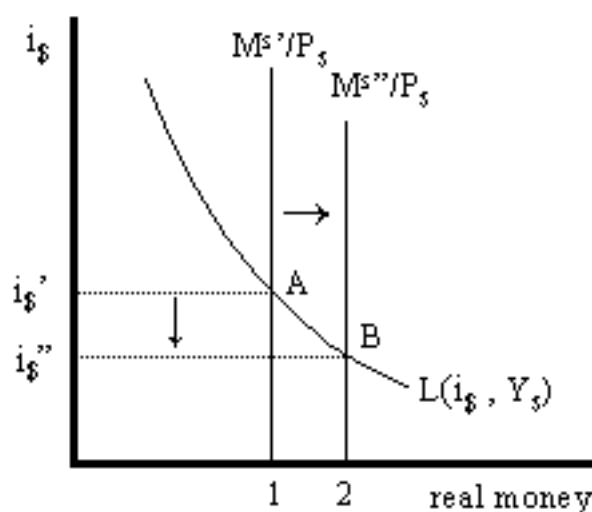
### 1.7.3 Relationship between Money and Interest Rates

In a market economy,<sup>21</sup> the rules of supply and demand affect interest rates. When the money supply increases, the market interest rates tend to decrease while a smaller supply tends to go up. It is difficult for most people, unless they have a lot of money, to make expensive purchases like buying a car or a house without borrowing, which means people often have a greater demand for money than their reserves can accommodate. They can only have access to these goods by borrowing some from banks, i.e. from those who have an excess of money. Interest rates will determine the cost of borrowing. The monetary policies applied by central banks will affect the money supply and hence the interest rates. Money is cheaper to borrow when there is plenty of it.

<sup>21</sup> A capitalistic economic system in which there is free competition and prices are determined by the interaction of supply and demand (Dictionary.com, 2017).

This relationship between money supply and interest rates is displayed in the graph below, which shows an expansionary monetary policy on interest rates. “Expansionary monetary policy refers to a policy initiative by a country's central bank to raise, or expand, its money supply” (Suranovic, 2015). The increase in money supply leads to a new equilibrium where the interest rate is lower.

Relationship between Money Supply and Interest Rates:



Source: (Suranovic, 2015).

Interest rates are not only a result of the interactions between the supply and demand for money. They also reflect the risk premium, which is the level of risk that investors and lenders are willing to accept.

## 1.8 Conclusion

In this chapter, we found that the term *money* encompasses many different aspects and serves four major purposes. Money can be defined as “standardised item, either digital or tangible, which is both a flow and a stock, trusted by people from a community, who agree to use it as a medium of exchanges”. Nowadays, fiat money is the largest type of money in circulation. This means that the most common currencies are legal tenders that are not backed by any commodity. Therefore, the faith people have in the governments issuing the currencies is extremely important as this is a main condition for the survival of those currencies. As Professor Bruno Colmant suggests, money lives only as long as it can gather enough believers.

Money and money supply deeply affect economic mechanisms which impact people in their daily life. As we mentioned, money which has some specific functions, affects business cycles, inflation, and other economic phenomena. Money has advantages, for example it facilitates exchange (money as medium of exchange) and exchange promotes specialisation. Producers can focus on what they do best at minimum cost and sell their production and services to consumers. With the money they make from selling their products and services, they can buy other goods and services. This will lead to an increase in productivity and efficiency. Productivity and efficiency are immensely useful for human society. Last but not least, money is also called a bearer of options because it gives people the opportunity to decide what they want to buy and at what price (Singh J. , 2016).

Money also has some downsides. First, it is not well distributed. The eight richest persons possess as much as the poorest 50% (Elliott, 2017). Money is on people's mind, and some can be so obsessed with it in such a way that it can result in stealing or counterfeiting. Money has also distracted people from more important matters such as peace, solidarity and human interactions.

## Chapter 2: Monetary Systems

Now that money has been defined, it is important to understand how it is regulated, by whom, and how it affects the economy. Therefore, we will explain and analyse the main current monetary system in this chapter. First, we will formulate a definition of a monetary system, followed by a history of monetary systems and how they have evolved to respond to an ever-changing economy. We will of course focus on the main current monetary system and its benefits and drawbacks. This chapter will aim to answer the question: Is the current monetary system still adequate in the current economy or is it time for a change?

In the second part of this chapter, we will explain and analyze the different international monetary systems (IMS) that have been introduced. After considering the definition over time of the IMS, we will discuss the current IMS and its strengths and weaknesses as well as alternatives. This thesis will thus address the question whether the current IMS is still fit to deal with the new challenges of today's global economy.

At the end of this section, we will tend to draw perspectives related to the state of the (main) current monetary system and propose possible alternatives that could stabilize and correct its limitations.

### 2.1 Definition of a Monetary System and its Pillars

A monetary system can be defined as follows: *“any formal structure adopted by a government that issues a currency which is accepted as the medium of exchange by its citizens and by other governments. Most monetary systems are managed by a central bank which is given authority to print money and control its supply in the economy”* (Investor Words, 2016).

To fully understand this definition, it is important once again to refer to the various functions of money. The primary function of money as a medium of exchange is accepted by almost everyone. It allows people to exchange money for goods and services. Second, we must explain what a central bank is. *“A central bank is a public institution that manages the currency of a country or a monetary union and controls the money supply – literally, the amount of money in circulation. The main objective of many central banks is price stability. In some countries, central banks are also required by law to act in support of full employment”* (European Central Bank, 2015). In other words, a central bank oversees a nation's monetary system. With their ability to dictate the direction of an economy, central banks play a pivotal role in a country's or monetary union's growth. In most cases, they are strictly speaking not government agencies

even though they serve their nation. Their responsibilities range widely, depending on their country. Central banks control monetary policies which mean they manipulate liquidity in the financial system to influence the economy. Their action will determine the currency stability as well as the levels of inflation and unemployment. They also regulate commercial banks and provide services for nation's commercial banks and its governments (Investopedia, 2015). Based on this definition, we can see that central banks play an important role in the economy and in the money supply. This is why we will analyse them more in depth, as monetary systems are managed by central banks. Central banks form the first pillar of the monetary system. There are three other pillars that play an important role in the current monetary system which are listed below:

- The bond market also plays an important role. It is where government-issued securities and corporate debt securities are traded. This is why it is also called the “debt market” or the “credit market”. Central banks buy or sell indirectly through commercial banks government securities to affect the money supply as we will discuss later.
- Governments and their decisions have an important impact on the monetary system.
- Commercial banks: The way they interact with central banks and economic agents is crucial. Because central banks do not lend money directly to economic agents, commercial banks play an intermediary role. Therefore, any decision from the central bank affects commercial banks which will then in turn affect economic agents.

The way those four pillars interact will be developed too.

## 2.1.1 Central Banks

### 2.1.1.1 Origins of Central Banks

According to Verra Smith, central banks are born to allow countries to increase their revenue. The goal of the first central banks was to finance the government so that it could, among other things, go to war (Rouanet, 2016).

The first central bank was created in 1668 in Sweden and was called the Swedish Riksbank. The Riksbank had two main goals: 1) lend the government funds to give them enough money

to go to war, and 2) act as a clearing house of commerce.<sup>22</sup> This bank was created as a joint stock bank<sup>23</sup> (Bordo, *A Brief History of Central Banks*, 2007).

The Bank of England, maybe the most famous of the era, was created just a few decades later in 1694. England had gained some political stability after the 1688 revolution. Since the country was stable, people invested in new businesses, but public finances were weak, and the system of money and credit was in disarray. Based on models like the Amsterdam Wisselbank in the Netherlands, England invited the public to invest in a new project, the Bank of England. They were able to raise over 1.2 million pounds in a few weeks, which became the starting capital stock of the Bank of England. This capital stock was lent to the government in exchange for a Royal Charter. Because investors were people and not the government, it was a joint stock bank. The role of the bank was to manage debt and be the government's banker (Bank of England, 2016). This debt they had to manage was the result of the revolution. In Europe, the majority of central banks were created during or just after periods of war, in times of great financial needs. As another example, Napoleon created "la Banque de France" in 1800. Those banks were the first of their generation and are also called early Central Banks. They issued private notes which served as currency and often had a monopoly on the production of those notes (Bordo, *A Brief History of Central Banks*, 2007).

Nevertheless, this explanation on the origins of central banks is not fully accurate. Some counter examples exist. The Federal Reserve was created in 1913 during a time of peace in the United States. The same goes for the National Bank of Switzerland which was established in 1907 (Rouanet, 2016). Another explanation closer to the "public choice theory"<sup>24</sup> exists. According to Murray Rothbard, an American economist and political philosopher, influential families played a role in the establishment of the Fed. They saw the Fed as a last resort lender and it permitted to release the restriction around monetary creation. So, it might have been "the financial elites, notably the Morgans, Rockefellers, and the likes who were responsible for putting through the Federal Reserve System, as a governmentally sanctioned cartel enabling the nation's banks to inflate the money supply in a coordinated fashion (Rothbard, 1999). According to Rothbard, central banks had two main goals: first, to finance more easily the

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<sup>22</sup> Affiliated agency or a facility operated by banks within a geographical area to act as a central site for collection, exchange, and settlement of checks drawn on each other (BusinessDictionary, 2017).

<sup>23</sup> A bank which is a public company with shares owned by investors rather than a government (Financial Times, 2017).

<sup>24</sup> Public choice theory argues that economic self-interest is the driving force of politics (Mariotti, 2016).

deficit of the State, and second, to transform the banking sector by allowing banks to create excessive credit without the drawbacks (Rouanet, 2016).

However, not everyone is convinced by Rothbard's theory. According to Charles Goodhart, a British economist, central banks appeared because of the inability of banks to solve a financial crisis. George Akerlof, an American economist, states that the 1890 depression was the result of euphoria followed by a movement of panic. Central banks were therefore created to regulate a monetary system that could not be regulated alone. This coincides with the post-Keynesian ideology. According to these authors, markets are chronically unstable and animated because of irrational euphoric behaviour. The logical consequence of this ideology is that a regulating central bank is necessary. Nevertheless, stability has often been an argument for the creation of central banks but nothing proves that their instauration has decreased the frequency or the intensity of crises (look at the 2007 economic crisis) (Rouanet, 2016).

For classic economists such as Ricardo and David Hume, commercial banks operations explain economic cycles and especially the existence of fractional reserves (see later). In France, Charles Coquelin, a French economist, showed a correlation between economic crisis and the irrational expansion of bank loans which is, according to him, the result of central banks and the disempowerment of commercial banks (Gille, 1959).

More recently, Richard Timberlake, an economist specialised in monetary and banking history, shared the following thoughts: "most of the monetary turbulence – bank panics and suspensions in the nineteenth century – resulted from excessive issues of legal-tender paper money" (Timberlake R. H., 2007). Banks were then unable to respond to the increasing demand for money, which led to recurring economic crises. Those crises inevitably led to the creation of central banks.

In conclusion, different theories exist on the reasons why central banks were created, and they vary greatly ranging from Ricardo to Keynes. Nevertheless, most central banks were created in times of war or post-war. Those are times when people start to rebuild their model. All these theories have in common a need for regulation of the banking system which is still today one of the most important tasks of any central bank.

### 2.1.1.2 Evolution of Central Banks

Central banks have evolved over time. Their role and their actions have changed, mostly because of the evolution of monetary systems. Since monetary systems are managed by central banks, these institutions had to adapt. It has been a trial and error process.

The early central banks like the Swedish Riksbank, the first central bank created in 1668 in Sweden, the Bank of England created in 1694 and “la Banque de France” established by Napoleon in 1800 had a dual role: “While these early central banks helped fund the government’s debt, they were also private entities that engaged in banking activities. Because they held the deposits of other banks, they came to serve as banks for bankers, facilitating transactions between banks or providing other banking services” (Bordo, A Brief History of Central Banks, 2007).

The United States Central Bank, also called the Federal Reserve, belongs to a second wave of central banks whose primary goal was to consolidate the various instruments used as currency and to provide financial stability. The Federal Reserve was established in 1913 under President Woodrow Wilson who enacted the Federal Reserve law. This second wave of central banks was also responsible for managing the gold standard<sup>25</sup> (Bordo, A Brief History of Central Banks, 2007).

Domestic economic stability was not a big deal for most central banks before the First World War. This changed completely after WWI, and governments started to be concerned about unemployment, price levels and business activity. Those responsibilities were partially shifted to the central banks. Monetary policies<sup>26</sup> which are laid down by central banks have an important impact on unemployment, price levels and business activity. Those monetary policies do not always have a positive effect. For example, the Federal Reserve is alleged to have caused the great depression of 1930 (Bordo, A Brief History of Central Banks, 2007).

In 1944, the Bretton Wood Agreement was signed and led to a new international monetary system which meant a change in the behaviour of central banks. A major goal of central banks was to keep inflation low and avoid recessions (Bordo, A Brief History of Central Banks, 2007).

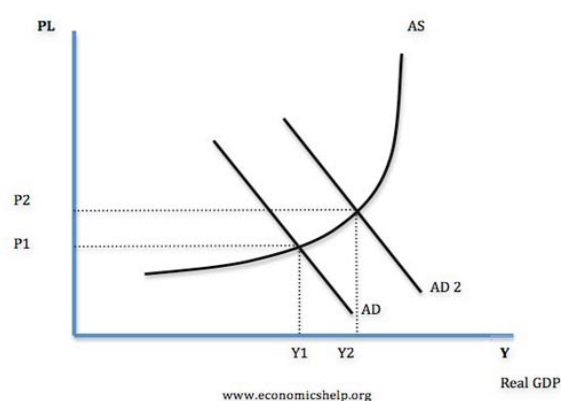
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<sup>25</sup> Gold standard can refer to several things, including a fixed monetary regime under which the monopoly government currency is fixed and may be freely converted into gold (Investopedia, 2017).

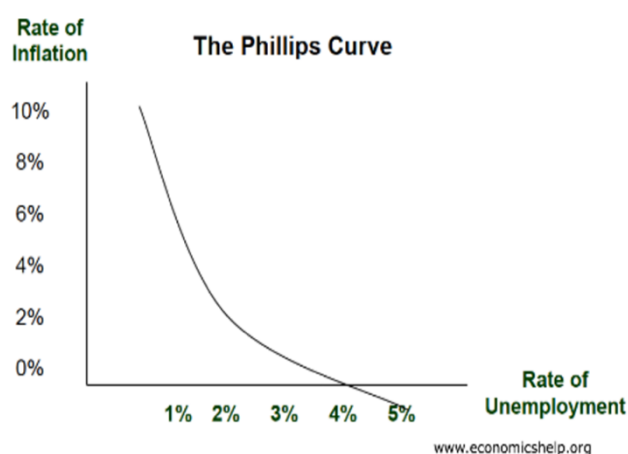
<sup>26</sup> Monetary policy is the macroeconomic policy laid down by the central bank. It involves management of money supply and interest rate and is the demand side economic policy used by the government of a country to achieve macroeconomic objectives like inflation, consumption, growth and liquidity (The Economic Times, 2017).

In 1960, central banks changed their priorities from lowering inflation to increasing employment. This is based on a Keynesian idea: “belief in the Phillips curve trade-off between inflation and unemployment” (Bordo, A Brief History of Central Banks, 2007). This resulted in inflationary pressure. As central banks were focused on high employment and not low inflation, they decided to decrease interest rates (shift from AD to AD2). This resulted in increased consumption. The real GDP increased too (from Y1 to Y2) and so did prices (P1 to P2), leading to inflation. Central banks did this as they assumed that when the real GDP increases, companies hire more workers which results in a decrease in unemployment which was their first goal. Their action is inspired by the Phillips curve where a trade-off between inflation and unemployment is assumed (Pettinger T. , Trade Off Between Unemployment and Inflation, 2011).

Interest Rates Versus Consumption:



The Phillips Curve:



Finally, in 1973, the Bretton Woods agreement came to an end and resulted in the free market currency valuation and exchange that still exists today.

### 2.1.1.3 Mission and Tasks of Current Central Banks

The main goal of central Banks nowadays is to maintain price stability. For example, the mission of the European Central Bank is the following: “the European Central Bank and the national central banks together constitute the Eurosystem, the central banking system of the euro area. The main objective of the Eurosystem is to maintain price stability: safeguarding the value of the euro” (European Central Bank, 2017). To maintain price stability, most central banks are in charge of defining and implementing monetary policies, bank regulation, and

financial services. Other tasks include ensuring the smooth functioning of payment systems, but this will not be discussed in this thesis.

#### 2.1.1.3.1 Defining and Implementing Monetary Policies

Central banks manage the money supply using different techniques depending on the economic situation. Those actions are called monetary policies. One of the main goals of central banks is to keep the economy healthy and growing. As an illustration, an increase in money supply can stimulate an economy that is growing too slow. Decreasing money supply can slow down an economy growing too quickly and prevent inflation. By affecting the money supply, central banks affect both micro and macroeconomic trends. At the micro level, an increase in the money supply will result in increased consumption. Loans will become more accessible and this will allow people to start new projects. At the macro level, changes in the money supply will affect the gross domestic product (GDP), overall growth, interest rates and unemployment rates (Bajpai, 2017).

Central banks can affect the money supply using the following techniques:

- Print money. Since central banks are responsible for printing money, they can simply print more money to increase the money supply. However, there are consequences: “printing more money doesn’t increase economic output in any way – it merely causes inflation” (Pettinger T. , The problem with printing money, 2012). Printing more money will therefore not be the first choice of central banks. It can also boost exports due to the depreciation of money. This aspect will be discussed later.
- Set the reserve requirement. “Banks are required to hold a certain amount of funds as reserves in their current accounts at their national central bank. These are called minimum reserves. A bank’s minimum reserve requirement is set for six-week periods called maintenance periods. The level is calculated on the basis of the bank’s balance sheet prior to the start of the maintenance period” (European Central Bank, 2016).

Central banks can affect the money supply by lowering or increasing the reserve requirement. By lowering the reserve requirement, commercial banks have to put less money aside to meet the reserve requirement and can therefore put more money into circulation by lending it to economic agents and other commercial banks. When central banks want to decrease the money supply, they can increase the reserve requirement which will result in a smaller amount of money in circulation (Federal Reserve Bank of San Francisco, 2001).

➤ Influence interest rates. Central banks are not responsible for the interest rates charged by commercial banks but they can influence them indirectly through several tools.

Please note that different interest rates will be mentioned in the following part of this thesis. If the type of interest rate is not mentioned, the term interest rate will refer to the interest rate for consumers.

- *Through policy rates.* A first way for central banks to push interest rates to their desired level is to modify the policy rate.<sup>27</sup> When central banks want to decrease interest rates, they will reduce the policy rate to reduce the costs of loans for banks. It will also reduce the interbank interest rate. These savings made by banks will be transferred to their customers by reducing interest rates. When interest rates are low, people will be more likely to borrow money which will lead to an increase of money in circulation. This is called expansionary monetary policy. The opposite situation with a higher policy rate will lead to a decrease of the money supply, which is also called contractionary monetary policy (Bajpai, 2017).
- *Through Engaging in open market operations (OMO).* Another way for central banks to push interest rates to the desired level is to purchase or sell government securities through a process known as open market operations (OMO). By buying or selling those securities, central banks can increase or decrease the money reserves of commercial banks. When central banks purchase these securities, they do so primarily by buying them from banks and hence increase the money reserve of banks which will lead banks to apply lower interest rates to lend this excess money. Lower interest rates will lead once again to an increase of the money in circulation as people will tend to borrow money. On the other hand, selling securities to banks will decrease the money reserves of banks and therefore increase the interest rates applied by banks, resulting in a decrease of the money supply (Ceballos, 2015).

The following graph shows the correlation between the interbank rate<sup>28</sup> (black dots) and M1 money supply (blue line) in Belgium. Interbank rates and policy rates are different: interbank rates are the rates between commercial banks, and policy rates are the rates issued by the central bank. Nevertheless, the decisions of the central bank will affect interbank rates and interest rates similarly. When the central bank decides to decrease the policy rates or to purchase

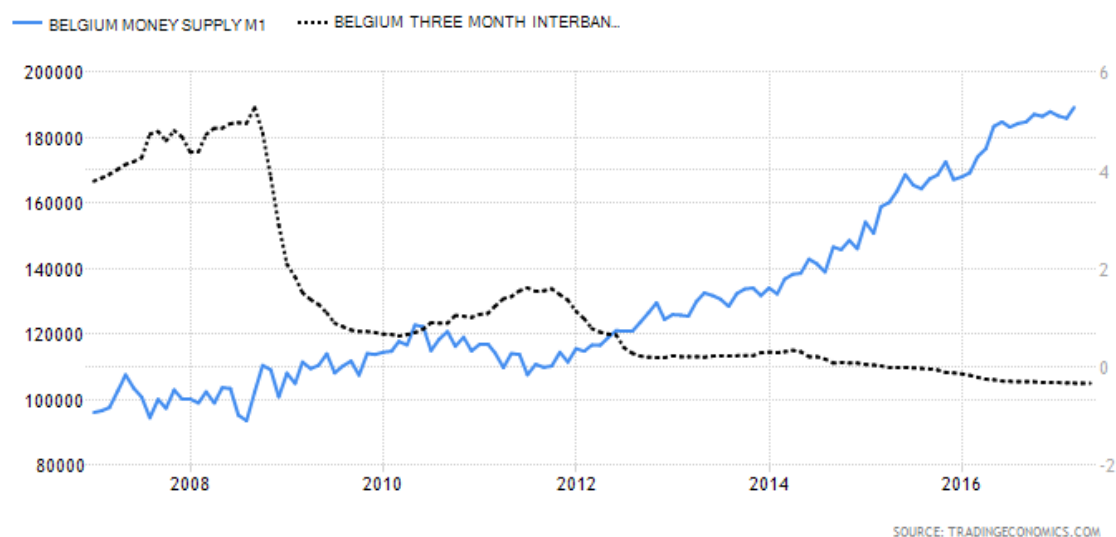
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<sup>27</sup> The policy interest rate is an interest rate that the monetary authority (i.e. the central bank) sets in order to influence the evolution of the main monetary variables in the economy such as interest rates (Focus Economics, 2017).

<sup>28</sup> The interbank rate is the rate of interest charged on short-term loans made between banks (Investopedia, 2017).

government securities, the interbank rate will decrease. If interbank rates decrease, banks with an excess of money will lend it to other banks at a lower rate. Those savings will be transferred to the costumers through lower interest rates, which will increase the money supply.

#### Correlation between Interbank Rate and M1 Money Supply:



Source: (Trading Economics, 2017).

- Introduce a quantitative easing program. Under a quantitative easing (QE) program “central banks create money by buying securities, such as government bonds, from banks, with electronic cash that did not exist before. The new money swells the size of bank reserves in the economy by the quantity of assets purchased – hence “quantitative” easing” (Avent, 2015). The main goal of a QE program is to encourage banks to give out more loans as it decreases interest rates.

#### 2.1.1.3.2 Bank Regulation

One of the main goals of the (European) central bank is to maintain financial stability. Central banks can ensure this financial stability by imposing rules and requirements on commercial banks. The purpose of these rules and requirements is to quantify and reduce the risks that commercial banks can take. Many regulations have been imposed on banks and sometimes also withdrawn (and this deregulation caused in a certain way economic crises). However, financial stability does not mean everything is frozen and nothing can change. “Indeed, economists agree that financial rules must remain flexible. The question is what can be changed and in what circumstances (Archer, 2009). Central banks have tools to limit and restrain commercial banks, such as requiring enough reserves to cover potential losses for their clients who entrust the

banks with their savings and for counterpart banks. Central banks will also warn the commercial banks of a risk that can affect the entire financial industry by publishing reports.

#### 2.1.1.3.3 Providing Financial Services

Central banks provide many financial services to commercial banks and governments. It is important to note that central banks never provide direct services to individuals. Individuals are affected indirectly by the decisions taken by central banks because those decisions affect commercial banks and governments.

Just like commercial banks, one of the services provided by central banks is to lend money to commercial banks at a certain policy rate. Another service central banks offer is economic statistics reports that will guide fiscal policy decisions by the government. Central banks also indirectly modify exchange rates<sup>29</sup> when they decide to increase or decrease the policy rate. As explained before, when a central bank decides to increase its policy rate, the interest rates applied by commercial banks increases too, leading to a decrease in money supply. Countries with a floating exchange rate will be affected as the exchange rate obeys the laws of supply and demand (see later). If the money supply decreases, prices go up. This has also effect on the value of the currency on the Forex market. Therefore, central banks are able to indirectly affect exchange rates (Amadeo, How Does the Government Regulate Exchange Rates?, 2017).

#### 2.1.1.4 Strengths and Issues of Central Banks

The most important strength of central banks throughout history is their fierce independence. As mentioned previously, central banks were built as a joint stock bank<sup>30</sup>.

Even if they provide services to governments, they are not managed by governments. This has occasionally changed in history when central banks were nationalised but it only lasted a short time before they once again became independent. Why is it so important for central banks to be independent? (Pettinger T. , Benefits of Central Bank Independence, 2016).

- Politicians in democratic countries are mostly interested in short-term results because they want to be re-elected based on their accomplishments. Therefore, they tend to make decisions on monetary policies without considering the long term. To be re-elected, it

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<sup>29</sup> Price for which the currency of a country can be exchanged for another country's currency (Business Dictionary, 2017).

<sup>30</sup> Joint Stock bank: "A bank which is a public company with shares owned by investors rather than a government" (Financial Times, 2017).

is tempting to decrease interest rates, which will result in an economic boom and boost economic cycles. The strength of central banks lies in their long-term view and the fact that they can follow long-term monetary policies (Pettinger T. , Benefits of Central Bank Independence, 2016).

- One of the goals of central banks is to keep inflation low. Being independent, they have more credibility which will help reduce inflationary expectations (Pettinger T. , Benefits of Central Bank Independence, 2016).

Nevertheless, some politicians are concerned with the independence of central banks for the following reasons:

- Some central banks are too focused on keeping inflation low when other matters may be more important, such as unemployment and economic growth (The Economist, 2017).
- They also argue that people working in central banks were not elected so why should they make such important decisions (The Economic Times, 2017)?

This statement perfectly sums up the independence of central banks: “The benefits of central-bank autonomy far outweigh its drawback. The friction between politicians and central bankers is healthy and cannot simply be wished away. To keep the critics at bay, central bankers must however be accountable for the powers delegated to them, and disciplined in their exercise” (The Economist, 2017).

A limited number of central banks are still government-controlled such as “The People’s Bank of China”.

#### 2.1.1.5 Conclusion

Central banks play a predominant role in the monetary system. They are responsible for the monetary policies that affect the economy and several of its parameters such as employment, inflation and interest rates. They also provide financial services and impose regulations on commercial banks to increase financial stability. As mentioned in the definition, the monetary system is managed by the central banks.

#### 2.1.2 Bond Market

To understand the bond market, it is important to first define the term *bond*: “A bond is a debt statement by which an investor loans money to an entity (typically corporate or governmental)

*which borrows the funds for a fixed period of time at a variable or fixed interest rate. Bonds are used by companies, municipalities, states and sovereign governments to raise money and finance a variety of projects and activities. Owners of bonds are debtholders and the creditors of the issuer”* (Investopedia, 2017).

What is the difference between a bond and a stock? When an economic agent buys a stock, he buys a fraction of the ownership of the company. When he buys a bond, he just lends money to the company, government or government agency, making him a creditor. Moreover, stocks are riskier than bonds which also means that returns from stocks are higher than from bonds.

The bond market is the “financial market consisting of bond issuers, underwriters, buyers and brokers/dealers” (Business Dictionary, 2017). Who are those issuers? Companies can issue bonds. Their goal is to borrow large amounts of funds to invest in expansion, acquisitions, and so on without diluting the shareholders of the company. Governments and government agencies can also issue bonds. The idea is to borrow money to invest in government programs (Little, 2016).

The bond market plays a crucial role in the money supply. Money supply can be increased by central banks through open market operations and quantitative easing programs as already previously mentioned. For more details on the terms used in the bond market, please see appendix A.1.

### 2.1.3 Government

Just as the term *money*, the term *government* is part of our daily lives and it is often difficult to grasp its role and implications of government decisions. Discussing the definition of government is not the purpose of this thesis, we will therefore use the following simple definition: “a group of people who control and make decisions for a country, state” (Troolin, 2017). A government deals with political, social and economic challenges, such as climate, education, justice, budget, debt, unemployment and immigration. The government needs money for this, which is collected through taxes, government bonds and return on investments. The bond market is used by the government to issue bonds that are generally considered safe. Moreover, the various policies and choices made by the government can affect the monetary system, which is why it is one of the pillars of the monetary system.

#### 2.1.4 Commercial Banks

Commercial banks are different from central banks: “A commercial bank is a financial institution that is authorised by law to receive money from businesses and individuals and to lend money to them. Commercial banks are open to the public and serve individuals, institutions, and businesses” (Grimsley, What Are Commercial Banks? - Definition, Roles & Functions , 2017).

Commercial banks have different functions such as lending money, receiving deposits and safeguarding money. Moreover, commercial banks also play an intermediary role between central banks and economic agents. All the decisions made by central banks will directly affect commercial banks and economic agents will be indirectly affected. This intermediary role is key in the monetary system.

### 2.2 How the Monetary System Works

Now that the monetary system and its four pillars has been explained, it is time to take a closer look at how it works and how the pillars are interconnected.

As mentioned previously, money was originally backed by precious metals (representative money). When economic agents went to the bank, they could trade their money for precious metal. This ended when fiat currencies appeared. Money is now backed by debt. Gold has been replaced by an “I owe you” (“IOU”). The biggest problem with this model is that if the debtor goes bankrupt, the promise becomes worthless and the debt cannot be repaid. In the recent past Europe was confronted with the bank bailouts and the quasi bankruptcy of countries. If a small company issues debt and goes bankrupt afterwards, this has an effect on a limited number of economic agents. This can however also happen to large banks and even to countries, leading to a chain reaction causing the implosion of its monetary system. To avoid such an implosion, countries and banks are bailed out by the European Central Bank including by QE programme (Addendum, 2016).

The US dollar is a good example of how money is created. It often starts when a country decides to spend more money than it has, which is also called deficit spending. To cover that deficit, the government treasury borrows money by issuing bonds. The treasury issues a bond on the bond market. Commercial banks buy those bonds which form the national debt, and make a profit by earning interests on the bond. Then, through open market operations, commercial banks sell some of the bonds to the Fed at a profit. To pay for the bonds, the Fed opens its check

book and pays commercial banks with what could be called “counterfeit” checks because they draw from an account that always has a balance of zero. The Boston Federal Reserve<sup>31</sup> stated that *“when you or I write a check there must be sufficient funds in our account to cover the check, but when the Fed writes a check, there is no bank deposit on which that check is drawn. When the Fed writes a check, it is creating money”* (Federal Reserve Bank of Boston, 1984). The Fed then hands those checks over to commercial banks. At this point, money springs into existence. Commercial banks use that money to buy more bonds and the same process repeats itself. This process makes the commercial banks that are playing the intermediary role more profitable, while making the public poorer by raising the national debt. The treasury then invests the newly-created money in the various branches of government. The cycle will repeat itself each time the government proceeds with deficit spending on public work, social programs, or war (Maloney, *The Monetary System Visually Explained*, 2015).

The second economic circle in the monetary system is between commercial banks and the general public including corporations (jointly referred to as the economic agents). All economic agents deposit their money in commercial banks. As explained previously, commercial banks must meet a certain reserve requirement which means that they will only keep a certain amount of money safely stored. The rest will be used primarily for lending.

Banks are obliged to keep a fraction of the deposits as a reserve but the rest can be used for lending. That is why the lending business of banks is referred to as fractional reserve lending. The best way to understand how it works is by using a simplified example derived from the United States banking system. If the reserve ratio of banks is 10% and someone deposits USD 100, the bank can legally take USD 90 and lend it out. The bank must hold USD 10 in reserve. In the United States these reserves are called vault cash. But why does the bank say that the economic agent has USD 100 on his bank account if the bank has lent USD 90 to someone else? Because the bank left in its place an “I owe you” (“IOU”) called bank credit. According to the Fed: “commercial banks create check book money whenever they grant a loan, simply by adding new deposit dollars in accounts on their books in exchange for a borrower’s IOU” (York, 1977). These USD 90 are nothing but numbers in the banks’ computers. These numbers are very different from traditional currency numbers as they are not backed by tangible money.

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<sup>31</sup> The Federal Reserve Bank of Boston is one of twelve Reserve Banks within the Federal Reserve System (Investopedia, 2017).

They are still considered as currency but are backed by debt. Now, with the onwards lending of USD 90 we have USD 190 in existence.

Economic agents will then go to the bank and ask for a loan to buy a car or a house. The borrower takes the USD 90 and pays the seller of the good. The seller then deposits the USD 90 at the commercial bank which will once again lend out 90% of it and leave bank credits in its place. So now we have USD 271 in existence. Once again, this process will repeat itself under a 10% reserve ratio. If an economic agent deposits USD 100 and the reserve ratio is 10%, the commercial bank can create up to USD 1000 of bank credit all backed by USD 100 of vault cash. This is the origin of the majority of our money supply. In fact, 92% to 96% of all money in existence is created not by the central banks but by the banking system. An increase in the money supply leads to inflation because the prices are rising. It also creates tremendous amounts of money backed by debt (Maloney, *The Monetary System Visually Explained*, 2015).

However, economic agents earn money by working with which they pay taxes to the tax collector which is the government. These taxes will of course be used to fund projects but also to reimburse the principal plus interest on the government bond bought by commercial banks (Maloney, *The Monetary System Visually Explained*, 2015).

The explanation above shows the impact of the four pillars on the monetary system and how they are interconnected. Governments issue bonds on the bond market that will be purchased by commercial banks. Through open market operations and even quantitative easing programs, central banks buy those bonds with money that does not exist. Commercial banks will use that money to buy even more bonds. This will be repeated time after time. The role of commercial banks in the creation of money supply is also important in fractional reserve lending. Once again there is a relation between the different pillars because central banks determine the reserve ratio.

### **2.3 Current Situation of the Monetary System**

The current situation of the monetary system is problematic. A first concern is speculation on the exchange market. Speculators buy or sell money to make a profit based on fluctuations in value between two currencies. This represent more than 98% of the transactions on the Forex market where more than 4 trillion foreign exchange transactions are made every day (Lietaer, Arnsperger, Goerner, & Brunnhuber, 2012). According to John Maynard Keynes: *“speculators may do no harm as bubbles on a steady stream of enterprise. But the position is serious when*

*enterprise becomes the bubbles on a whirlpool of speculation. When the capital development of a country becomes the products of activities of a casino, the job is likely to be ill-done”* (Keynes, 1936).

The repercussions of the 2007-2008 economic crisis are still felt today. The causes have been investigated by several authors. They all tend to conclude that derivatives and failure coverage such as swaps that offer a coverage against default payments are the main source of the 2007 crisis. All those analyses gave reasons for the crisis but none gave a solution to avoid future crises. This has been the case throughout history. Indeed, between 1970 and 2010, 145 banking crises, 208 monetary crashes and 72 sovereign debt crises occurred. A sovereign debt crisis arises when a country default on its short-term payments. A monetary crisis occurs when the value of a currency brutally falls compared to currencies from other countries. Finally, a banking crisis occurs when banks are going bankrupt. The government has to nationalise banks or bail them out. A combination of those three crises is called a systemic crisis. Commercial banks, central banks and the International Monetary Fund (IMF) simply recommend restoring the situation as quickly as possible without proposing any structural modification. However, if the structure of the monetary system is not adapted, it is likely that future crises will keep hitting the economy. This does not mean that the whole monetary system needs to be completely changed but structural reforms are needed. The impacts of economic crises include: an increase of unemployment, human and social costs as the number of poor people will increase along with insecurity, and a decrease in production, which costs of transfer will be covered by the taxpayer, and finally an increase of the public debt (Lietaer, Arnsperger, Goerner, & Brunnhuber, 2012).

The main type of currency currently used is a national fiat currency attached to positive interest rates which is competitive and scarce can also be problematic as it will be discussed later.

### 2.3.1 Types of Societies

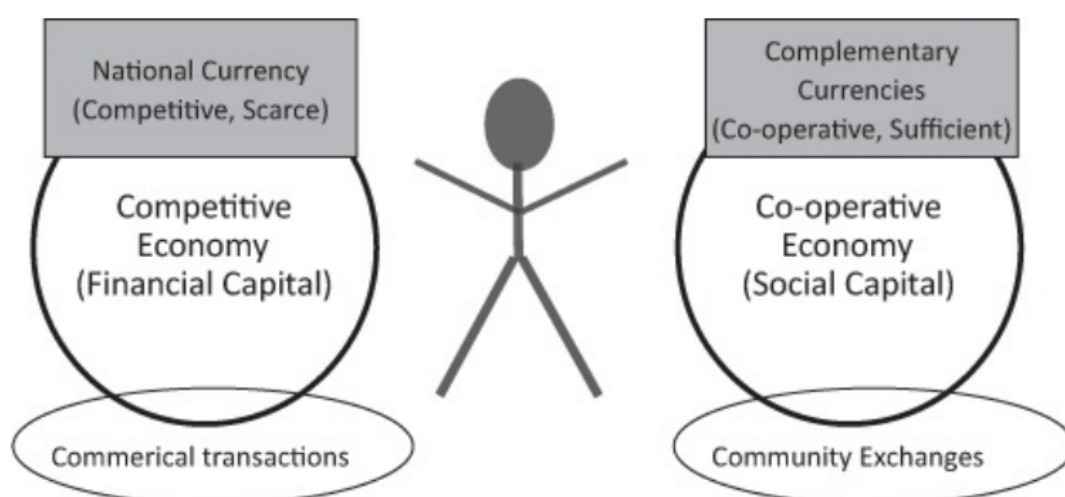
Before describing the current economic system, it is important to give a description of the two different types of societies in which people have organized themselves in the course of history and their lien to the economic system. First, the patriarchal society, which is embedded with patriarchal values such as competition and power. Examples in history are the Roman and Greek empires. In this type of society, a single currency is attached to positive interest rates which brings resources to the top. Money itself is issued from the top. On the other hand, a matrifocal society is based on feminine values such as empathy and tolerance. In this society,

there are two types of currencies. One is similar to the patriarchal one and is only used for dealing and trading with foreigners. The second type of currency has values and missions which are the opposite of the patriarchal society and is used for local trades. The currency has no positive interest rate or even a negative interest rate and is thus only used as a medium of exchange and not as a store of value. This currency is used from the bottom up (Lietaer, What about money? Bernard Lietaer interviewed by Lars Schall, 2012).

Today's society is still very much a patriarchal society which is to a certain extent the cause of economic problems. By introducing another type of currency and using both types in parallel, and thus a transition to a matrifocal society some of the economic problem might be resolved.

### 2.3.2 Types of Economies

The current system is made of two types of economies. First is the global competitive economy, which is characterised by national currencies that are competitive, scarce and attached to positive interest rates. This type of currency supports the financial capital. Nowadays, this economy has a monetary monopoly through its national currency over the other type of economy, the cooperative economy, which supports social capital. This economy is present in our current system but is not autonomous and requires funding from the competitive economy in the form of subsidies obtained through taxes, or with fiscal deductions for NGOs. As taxes are not popular among people, subsidies to the cooperative economy are limited. As an illustration, the salary of a teacher is around 12,000 times smaller than that of an investment banker (Lietaer, Au coeur de la monnaie, 2011).



Activation of Co-operative and Competitive Economic Circles

**Source:** (Kennedy, Lietaer, & Rogers, People Money: The Promise of Regional Currencies, 2012).

Each currency system has limits. The problem with the current monetary system and its national currency is its monopoly. Different currencies are used, such as the euro or the dollar, but these are all the same type, i.e. competitive, scarce fiat currencies attached to positive interest rates. Because it is a monopoly, no tools exist to fix the drawbacks of the system. Creating complementary currencies could help the cooperative economy become more autonomous instead of relying on the competitive economy. However, it would not create a complete separation between the two economies, because transfers between them are important. The complementary and national currencies would work in parallel (Lietaer, *Au coeur de la monnaie*, 2011).

### 2.3.3 Advantages of the Current Monetary System

It is important to recognise the benefits of the current monetary system. It made the industrial revolution possible with all its positive consequences. It also led to significant progress in science and development of material production. It worked as a remarkable wealth creation mechanism and needs to keep fulfilling this function in a more evolved monetary system (Lietaer, Arnsperger, Goerner, & Brunnhuber, 2012).

The monetary system is also a source of opportunities:

- Good money supply management, with a particular attention to inflation. As explained previously, central banks can modify the money supply through monetary policies (Kennedy, Lietaer, & Rogers, *People Money: The promise of regional currencies*, 2012).
- Saving people money, because interest rates are usually higher than inflation (Kennedy, Lietaer, & Rogers, *People Money: The promise of regional currencies*, 2012).

### 2.3.4 Drawbacks of the Current Monetary System

A key factor in the monetary system is that it is entirely based on interests linked to bonds or loans issued by commercial banks. This means that there is interest due on every currency in existence. For example, if the one and only dollar in existence is borrowed with interest how can the economic agent pay it back? There is no second dollar available to pay interests on the dollar he borrowed. Borrowing results in the need for additional money. This example illustrates the current situation where there is never enough currency to repay debt. Moreover, if people stop borrowing money, no new currency will be created to reimburse the principal and interests. As an illustration, if the principal from each bond and loan were paid off, the

entire money supply would vanish. So, if a country is less indebted every year, the whole system goes into a deflationary collapse under the weight of those payments.

According to Bernard Lietaer, the current monetary systems show a similar trait which is “nationwide, government-enforced monopoly of a single type of currency created by banks through loans attached to positive interest rates” (Lietaer, What is the problem with our current money system, 2010). This feature allows for capital accumulation which was very positive in fast industrialisation. However, this system has several drawbacks that cannot be ignored any longer. Positive interest-based currencies lead to drawbacks such as: 1) short-term vision of the economy, 2) the need for endless growth, 3) growing inequalities, 4) speculation, 5) deterioration of social connections and community, and 6) the procyclical aspect of money exacerbates business cycle upturns and downturns (Lietaer, What is the problem with our current money system, 2010).

We will explore the main effects of positive-based currencies issued by banks through loans.

- Short-term vision. People tend to focus on immediate success rather than long-term success and stability. The reasoning of economic agents behind this is quite simple. The more an economic agent projects himself in the future, the more the predictions lose in precision and the more the risk increase. Economic agents being averse to risk, they will favour short-term results (Lietaer, Arnsperger, Goerner, & Brunnhuber, 2012).
- Deterioration of social connection and community. When a bank issues a loan to an economic actor, it only offers the principal. In return for the loan, the bank expects the borrower to repay the principal as well as interests. Because interests are not created by the bank but requested to the agent, it is up to him to find money to reimburse the bank. Therefore, the borrower has to use the principal from another economic actor in order to pay back interests to the bank. This system forces people to compete so they can earn the money to repay the banks. Competition will thus lead to selfishness instead of cooperation (Lietaer, What are the three main effects of interest-based currencies, 2010).
- Need for endless growth. In the real world, population, outputs and money supply increase at their own pace. Growth is real but it is used for reimbursing interests. In this sense, interest rates determine growth rates. This leads to a perpetual (high) growth which is not sustainable, ecologically and otherwise (Lietaer, What are the three main effects of interest-based currencies, 2010).

- Concentration of wealth: poor against rich. Positive interest rates create a transfer of money from a large majority, poor people, to a small minority, rich people. People who have enough money collect interests and can also afford lending a part of their wealth to people who do not have enough money and therefore have to borrow it (Lietaer, What are the three main effects of interest-based currencies, 2010). Joseph E. Stiglitz, a recipient of the Nobel Prize in economics, presents in his book the drawbacks of large inequalities in societies. A divided society benefits no one and can create many dangers (Stiglitz, 2012).

Wealth distortion can also come from the activity of interest groups and lobbyists. They act as a retroactive loop for legislators and citizens to discuss laws. Lobbyists are expensive which means that individuals and smaller groups cannot afford them, which means they cannot make themselves heard. Therefore, money leads to power which will lead to political influence. Political influence will be used by rich people to pass laws that make them even richer (Lietaer, Arnsperger, Goerner, & Brunnhuber, 2012).

- The pro-cyclical tendency of money creation and flow. Creating money amplifies cyclical fluctuations in the economy. In good times, banks will be generous and grant loans to economic agents. This will result in a change from a positive economic context to an inflationary boom. On the other hand, when times are bad, banks will turn off the tap and limit the access to credit, pushing the economy from a conjunctural dip to a recession (Lietaer, Arnsperger, Goerner, & Brunnhuber, 2012).

The cyclical economic fluctuations tend to waste the invested capital. During the expansion phase, companies are under-equipped in units of production, in labour and equipment and suddenly they have too much labour, units of production and equipment. This leads to unemployment and social difficulties (Lietaer, Arnsperger, Goerner, & Brunnhuber, 2012).

### 2.3.5 Conclusion

The current monetary system was essential in the industrialisation transition because of its rapid and high economic growth. However, the multiple drawbacks mentioned above show us that the current monetary system does not address the challenges of today and shows its limitations.

The monetary system is facing a crisis, and injecting capital in the system at the expense of taxpayers will not prevent future crises. The difficulties that the economy is facing can be compared to a car driver and a car builder. A perfectly designed car driven by a very bad driver can end up in an accident. If the car is not well designed, even the best driver runs the risk of a

car accident. The same applies to the monetary system: appropriate rules and quality banking management are important but if the conception is defective, it can lead to unavoidable, repetitive breakdowns of the system. It is therefore important to determine the structural problems of the monetary system. According to Bernard Lietaer, the main issue of the monetary system is “the monopoly of a single type currency created by the banking system through loans attached to positive interest rates (debt)” (Lietaer, What is the problem with our current money system, 2010). Other dimensions such as education and governance also play a role but will not be discussed in this thesis.

In conclusion, the monetary system is based on fiat currencies which have shown throughout history to go back to their intrinsic value which is zero. The failure ratio is 100% (Maloney, 140 Years Of Monetary History In 10 Minutes, 2013). So far, no monetary system based on fiat currency has been able to salvage its currency.

## 2.4 International Monetary Systems

As the world becomes more connected and globalisation has become a macro trend, monetary systems also become more global. It is therefore important to define the *international monetary system*. The notion of an international monetary system (IMS) includes the idea of organisation. The IMS represents all the mechanism and institutions who aim at organising and regulating the international monetary exchange around an exchange rate regime. This system covers for example how economic agents can use money, which kind of money is put at their disposal and how it is created. This organisation is derived from the requirements of international trade. An economic and commercial relationship between nations is only possible when economic agents can convert their currencies into other national currencies.

### 2.4.1 Definition of an International Monetary System

According to the European Central Bank, “*an international monetary system can be regarded as (i) the set of conventions, rules and policy instruments as well as (ii) the economic, institutional and political environment which determine the delivery of two fundamental global public goods: an international currency (or currencies) and external stability*” (Dorrucci & McKay, 2011).

- (i) The set of convention, rules and policy instruments include “the conventions and rules governing the supply of international liquidity and the adjustment of external imbalances; exchange rate and capital flow regimes; global, regional and bilateral

surveillance arrangements; and crisis prevention and resolution instruments” (Dorrucci & McKay, 2011).

- (ii) The first public good that is delivered by the IMS are the international currencies. They are international because each currency (or at least nearly all of them) can be converted into foreign currencies. They are global international currencies because economic agents from different countries can use these currencies as medium of exchange, a unit of account and a store of value. As mentioned previously, those are the three functions of money from which a fourth one can be derived: money as a deferred payment. This allows economic agents from around the world to interact with international economic and financial activity. The second deliverable is external stability. It refers to “*a global constellation of cross-country real and financial linkages (e.g. current account and asset/liability positions) which is sustainable, i.e. does not, and is not likely to, give rise to disruptive and painful adjustments such as disorderly exchange rate and asset price swings or contractions in real output and employment*” (Dorrucci & McKay, 2011).

Why can international currencies and external stability be referred as public goods? We must first understand the notion of *public good*: “A public good has two key characteristics: it is non-excludable and non-rivalrous.” (Khan Academy, 2016). First, those goods are non-rivalrous because one country’s consumption does not influence the amount of goods available in another country. Second, they also are non-excludable because it not possible to prevent the consumption of that good (Dorrucci & McKay, 2011). Public goods often lead to a so-called free rider problem<sup>32</sup> because the costs for the provider are higher than the returns (Dorrucci & McKay, 2011).

#### 2.4.2 Evolution of the International Monetary System

In the past century, the world has known four different international monetary systems, which either collapsed under their own weaknesses or had to be substantially adapted to cope with the ever-changing economy.

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<sup>32</sup> The free rider problem is a market failure that occurs when people take advantage of being able to use a common resource, or collective good, without paying for it, as is the case when citizens of a country utilise public goods without paying their fair share in taxes (Investopedia, 2017).

## 2.4.2.1 Gold Standard

### 2.4.2.1.1 Definition

The first IMS was the gold standard which is: “*a commitment by participating countries to fix the prices of their domestic currencies in terms of a specified amount of gold. National money and other forms of money (bank deposits and notes) were freely converted into gold at the fixed price*” (Bordo, Gold Standard, 2008). Economists tend to disagree on the start date of the gold standard. For more details on the history of the gold standard, see appendix A.2.

### 2.4.2.1.2 Advantages of the Gold Standard System

The main advantage of the Gold Standard System is that gold is used as a fixed asset to back the money value (Amadeo, What Is the Gold Standard? How Would a Return Affect the U.S. Economy?, 2017).

Secondly, a central bank can only print as much as money as there is gold in the country. This results in a self-regulated and stable economy. Since central banks can only print as much as its gold reserve, there is no excess of paper currency which can lead to inflation. Supply side inflation can still happen however. A general cut in production or a natural disaster can occur. This system will also make budget deficits and national debt less likely for the same reason. However, there is evidence that even before World War I, central banks did not contract the money supply when there was a gold outflow (The Editors of Encyclopædia Britannica, 2017).

A third advantage of, the Gold Standard System is that it creates certainty in international trade by providing a fixed pattern of exchange rates. Moreover, this system rewards productive nations. A country exporting a lot will receive more gold which means they will be able to print out more money (The Editors of Encyclopædia Britannica, 2017).

Finally, from a more historical point of view, gold led to the exploration of the globe. Even before the Gold Standard System, Spain and other countries discovered the New World as they were looking for gold to increase their prosperity. During the Gold Standard System, gold was discovered in California and Alaska which led to the Gold Rush (Amadeo, What Is the Gold Standard? How Would a Return Affect the U.S. Economy?, 2017).

### 2.4.2.1.3 Disadvantages of the Gold Standard System

One of the biggest issues with the “Gold Standard Systems” is that it does not provide sufficient flexibility in the supply of money. The economy is dependent on the money supply. As

mentioned previously, an increase in the money supply can be used as a tool to push economic growth, which is not possible with this system. With the Gold Standard, central banks and governments have their hands tied, so whenever an economic disaster occurs, it is difficult for them to intervene, often resulting in the collapse of the world exchange system (Parikh, 2012).

Second, countries that do not possess any gold find it very hard to be competitive as they do not have the money supply to invest in projects and people. Furthermore, since gold is not divided equally, countries that have less gold can be exploited by those that have more (The Editors of Encyclopædia Britannica, 2017). However, countries that had large amounts of gold but were not developed enough became the victims of developed countries through colonisation and plundering.

The third disadvantage of this system is the obsession with gold. Countries are so obsessed with keeping gold to back their money supply that they tend to forget the most important point, which is improving business climate (Amadeo, What Is the Gold Standard? How Would a Return Affect the U.S. Economy?, 2017).

Finally, this system is expensive. Whenever an important transaction is completed between countries, huge amounts of gold have to be shipped. Loading it on the boat, insuring it against theft and possible sinking of the boat, this all costs money and is a slow process. This type of transaction is even more unrealistic in an increasingly globalised world (Suleyman, 2016).

#### 2.4.2.1.4 Is it Possible to Return to a Gold Standard System?

Returning to a Gold Standard System might be possible, but is it realistic? This will be determined from the perspective of the United States since they played such an important role during the “Golden Standard System”. As a first consequence, the Federal Reserve would no longer be able to manage the money supply. Monetary policies would no longer be applied as the money supply is linked to the gold reserves. The ability to manage the economy would be strongly impaired. Returning to a Gold Standard System might however lead to more fiscal discipline, a more balanced budget and limited government interventions (Amadeo, What Is the Gold Standard? How Would a Return Affect the U.S. Economy?, 2017).

From a business perspective, returning to the Gold Standard System would prevent a lot of business and projects from being funded. The money supply would depend on the amount of gold available, and would therefore limit economic growth. For one country to return to that system alone would just be pointless. If the United States decided to do it on their own, other

countries would ask them to redeem their dollars in gold; the gold supply in the United States would decrease, and limit economic growth even more. Therefore, all countries need to agree to change their international monetary system for it to have a chance to succeed. Furthermore, the United States does not possess enough gold to reimburse their foreign investors. For example, in 2011 when gold reached a peak of USD 1,895 per oz., the gold reserve of the United States was worth 445 billion dollars. The debt of the United States at the same period was over 4.7 trillion dollars which is ten times more (Amadeo, What Is the Gold Standard? How Would a Return Affect the U.S. Economy?, 2017).

This system would also introduce a fixed exchange rate between foreign currencies. This mechanism is not viable with the political visions of full employment and economic growth (Schwartz, 2000).

Thus, the reintroduction of the Gold Standard System does not really seem realistic. Globalisation has led to an integrated global economy where countries work together. Going back to the Gold Standard System would make countries adopt a more isolated behaviour as they will try to accumulate as much gold as possible to increase their money supply. Such an isolated behaviour is not adapted to the current global economy (Amadeo, What Is the Gold Standard? How Would a Return Affect the U.S. Economy?, 2017).

#### 2.4.2.1.5 Conclusion

The Gold Standard System has prevailed for a long time. Gold was already used centuries ago and has always been a sign of prosperity. Trade evolved and became more international which created the need for an international monetary system. The Gold Standard System fulfilled that role but the economy kept on changing and led to situations where the system was no longer appropriate. Just like any system, the Gold Standard System has positive and negative aspects as mentioned above. Reintroducing this system in a global economy does not seem realistic.

#### 2.4.2.2 The Bretton Woods System

The Bretton Woods Agreement is a famous international monetary agreement that followed a United Nations Monetary and Financial Conference meeting held in Bretton Woods, New-Hampshire from July 1 to July 22, 1994. Two of the three significant results of that conference still survive today. First, the meeting resulted in the creation of the International Bank for Reconstruction and Development which is now the World Bank. It also created the International Monetary Fund (IMF). Both the World Bank and the IMF continue to foster global monetary

cooperation, secure financial stability, facilitate international trade, promote high employment and sustainable economic growth and reduce poverty. The other major issue that was addressed during the meeting involved the stabilisation of exchange rates. The solution called the Bretton Wood System was a currency exchange rate based on the gold standard. Each of the forty-four nations which were part of that agreement accepted to fix their exchange rates by tying their currencies to the US dollar. This helped the countries to engage in foreign trade and grow their economies (Investopedia, 2015). For more details on the history of the Bretton Woods System as well as the IMF and the World Bank, see appendix A.3.

#### 2.4.2.2.1 Advantages of the Bretton Woods System

A first main advantage of the Bretton Wood System results from the fact that stable exchange rates eliminate uncertainty and risk from international trade and investment transactions, helping both importers and exporters. Indeed, costs for the importer and profits for the exporter are uncertain if the exchange rate varies. By accepting to align their currencies to the dollar which was fixed to gold, countries were rid of uncertainty which is good for an orderly and steady growth. However, countries did not want to make the same mistake as with the gold standard by being too rigid. Therefore, the exchange rate could still be modified by 1% under some conditions (Suleyman, 2016).

Second, the Bretton Wood System requires a strong discipline on the economic policies of the participating nations. Since exchange rates are fixed but adjustable up to 1%, countries are prevented from adopting irresponsible macro-economic policies (Suleyman, 2016).

Third, a fixed exchange rate will attract foreign investors. When exchange rates vary, they represent a higher risk for investors. They tend to not invest when there is too much fluctuation. A fixed exchange rate prevents fluctuation and decrease the risk for foreign investors (Shruti, 2016).

A fourth advantage of a fixed rate is that it is anti-inflationary. If the variable exchange rate of a country decreases, the quantity of imported goods will decrease, because imported products will become more expensive for the importing country and make them scarer. Scarer goods are more expensive which leads to inflation. This shows us that fixed exchange rates can prevent such a situation (Shruti, 2016).

Finally, fixed rates make speculation pointless. If people believe that the exchange rate will not change for a long time, this will prevent speculation on the exchange rate. However, speculation may still occur within the 1% margin (Triple A learning, 2017).

#### 2.4.2.2.2 Disadvantages of the Bretton Woods System

Countries can face balance of payments<sup>33</sup> deficits resulting in adjustments of the exchange rate within the 1% range. Speculators will try to determine whether the balance of payment of a country will be positive or negative. If they think the balance of payment of a country will be positive, speculators will buy currencies of that country on the foreign exchange market. If the situation lasts for a long time, central banks may be forced to increase exchange rates. If central banks decide to do so and reverse the situation, speculators will sell home currencies again and make a profit. This situation led to the collapse of the Bretton Woods System when economic agents speculated on the US dollar (Shruti, 2016).

Second, it is necessary for each country to possess a foreign exchange reserve to maintain a fixed exchange rate. Just as it was during the gold standard, it is more difficult for poor countries to hold an adequate volume of foreign exchange reserve.

Finally, the competitiveness of the international market is bypassed since it is not reflected by the fixed exchange rate. The only way to make home products competitive is by changing domestic policies.

#### 2.4.2.2.3 Is it Possible to Return to a Bretton Woods System?

Under a new form of the Bretton Woods system, the exchange rates would need to be determined by central banks or finance ministers. It is however demonstrated that central banks and finance ministers cannot clearly assess the right exchange rates of currencies (Schwartz, 2000). A return to a Bretton Woods System would thus not be feasible.

#### 2.4.2.2.4 Conclusion

The Bretton Woods system arrived just at the end of WWII. Forty-four countries became members of the Bretton Woods agreement. The IMF and the World Bank played an important role in the success of the agreement. However, the system came to an end because of speculation

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<sup>33</sup> The balance of payments is the record of all international financial transactions made by a country's residents. A country's balance of payments tells you whether it saves enough to pay for its imports (Amadeo, What is balance of payments? Components and deficit, 2017).

on the US dollar which was the only currency that could be converted into gold. A return to a new form of the Bretton Wood System does not sound realistic as central banks and finance ministers do not have the capacity to assess clearly the right exchange rates of currencies.

#### 2.4.2.3 Fixed or Floating Exchange Rate

The floating foreign exchange rate officially became the new international monetary system during the 1976 Jamaica agreement, just three years after the Bretton System collapsed. It can be defined as a *“system in which a currency's value is determined solely by the interplay of the market forces of demand and supply (which, in turn, is determined by the soundness of a country's basic economic position), instead of by government intervention. However, all central banks do try to defend these rates within a certain range by buying or selling their country's currency as the situation warrants”* (BusinessDictionary, 2016). Gold would no longer be used as a standard value to which the US dollar was pegged. However not all countries are using the floating exchange rate system but some are (still) using the fixed or pegged exchange rate. Some countries refuse to let their currency float. Those countries, most of which are in Africa and in the Middle-East, set a fixed exchange rate which is said to be pegged or fixed by their central bank to another currency. A fixed exchange rate is *“an exchange rate for a currency where the government decided to link their value to another currency or to some valuable commodity like gold”* (The Free Dictionnay, 2012). Therefore, the three following exchange rates will be discussed: 1) managed floating rates, 2) hard pegged exchange rates, and 3) soft pegged exchange rates. We will mainly focus on the floating exchange rate used in Europe and in the United States.

To understand exchange rates and how they are affected by central banks, we must first analyse the impact of the exchange rate on the economy. The exchange rate of an economy affects international trade, service sector, technology transfer and international remittance and capital inflows (EarnForex, 2016).

- International trade. The exchange rate will strongly affect a country's imports and exports. If the exchange rate is strong, imports will rise since the amount of goods which can be purchased for every euro will increase. Exports on the other hand will tend to decrease since the goods from that country will be more expensive for other countries. A weak exchange rate will cause the opposite situation (EarnForex, 2016).
- The service sector. The service sector, which produces intangible goods such as transport, tourism, and banking, is based on the same principle as international trade,

and is therefore affected by the currency exchange rate. If the currency exchange rate is strong, foreign customers abroad will have to pay more to obtain the equivalent of one euro of service. And when the exchange rate is weak, foreign customers will have to pay less for the equivalent of one euro of service (EarnForex, 2016).

- Technology transfer. Again, a strong exchange rate is beneficial in this case. When the exchange rate of a country is strong, it becomes easier to acquire new technologies without draining the foreign exchange reserves. Also, it provides bargaining power in negotiations for those new technologies (EarnForex, 2016).
- International remittance and capital inflows. If a country has a strong currency, meeting its obligations will become easier. It provides a positive sign for the investors who feel confident about the solvency of the country, in turn increasing capital inflow and therefore helping the country's economy with new investments.

After describing the impact of exchange rates on the economy, we will now discuss the different types of foreign exchange rates.

#### 2.4.2.3.1 Managed Floating Rates

The international monetary system of floating exchange rates, in which exchange rates are governed by the laws of supply and demand, is the system that prevails in the world. When the Bretton Woods System ended, most countries had reached their limits with Nixon's currency games and decided to distance their currency from the dollar. Currencies began to float independently. This system only became official after the 1976 Jamaica agreement (Lewis, 2011).

A managed floating exchange rate is a system in which an official parity between currencies does not exist. The currency value is not defined by a standard value. The exchange rate varies freely on the exchange market according to supply and demand. Therefore, "a floating exchange rate is the exchange rate between two currencies at any given time" (Investopedia, 2017). The supply and the demand for various currencies are related to international exchanges of goods and services and to the movements of international financial actives. A country generally buys foreign currencies so it can import goods and services from that foreign country. The same principle is used for financial actives. Just like any other securities, currencies are traded on a market, the foreign exchange market for currencies, also called the "Forex" (Vautherot, 2011). The exchange rate of a currency follows the trend of the day. A decrease in the exchange rate of a currency is called depreciation while an increase is called appreciation. Even though central

banks rarely intervene, they sometimes do to avoid inflation. This is why it is also called managed floating rates (Evrensel, 2017).

➤ Advantages

The first benefit of a floating exchange rate is that there is no need for international management of exchange rates. During the Bretton Woods System, the IMF was needed to overlook current account imbalances. In a floating foreign exchange rate, an international manager is not needed because when the current account of a country shows a deficit, the currency will automatically depreciate. This depreciation will boost exports which will then reduce the deficit and put the country back in balance. Even though an international monetary fund is no longer required for that specific function, it still exists today and has other functions, as mentioned earlier (Evrensel, 2017).

Second, a floating foreign exchange rate system requires less central bank intervention since there is no parity to uphold. In the gold standard and the Bretton Woods System, the main goal of the central bank was to protect the gold parity. There is also an automatic stabilisation of the balance of trade<sup>34</sup> which decreases the need for central bank intervention. For example, the devaluation of a domestic currency compared to foreign currencies will result in a greater need for domestic currency to buy imported goods. Prices of imported goods in the domestic country will increase; economic agents will buy less of them and go for domestic goods instead. With an increase in domestic goods purchases, the import of similar goods will decrease, resulting in a shift in trade from a deficit to a surplus. This surplus will increase the floating exchange rate of the domestic country in relation to foreign currencies. If the floating exchange rate goes up, the price of import will decrease. This cycle can be repeated numerous times and the other way around (Investopedia, 2017). Additionally, exports will increase due to the depreciation of the currency, which also decreases the deficit of the country.

Finally, there is no need for capital flow restrictions. The exchange rate is affected by macroeconomic fundamentals which in turn affect portfolio flows between countries. This enhances market efficiency. It becomes more complicated when the exchange rate and parity are fixed while the portfolio flows are moving in and out of the country (Evrensel, 2017).

➤ Disadvantages

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<sup>34</sup> The balance of trade compares the value of a country's exports of goods and services against its imports. When exports are greater than imports, that's a trade surplus (Amadeo, Balance of Trade: Favorable vs Unfavorable, 2017).

The first issue arises from the level of uncertainty that comes with floating exchange rates. Since the value of a currency can change from day to day, it is more risky to proceed with cross-border transactions and to agree on which currency to use. This could also prevent businesses from investing in foreign countries if the uncertainty around domestic currency is high. However, this uncertainty can be reduced by using derivatives such as forward exchange contracts to fix the exchange rate in the future (Economics Discussion, 2016).

Second, the daily fluctuation characterised by the floating exchange rate system can encourage speculation on the exchange rate between currencies. This behaviour can then have an impact on the fluctuations of these currencies by amplifying these fluctuations (Economics Discussion, 2016).

#### 2.4.2.3.2 Hard Pegged Exchange Rates

Under the hard pegged exchange rates system there is an obligatory use of another country's currency to determine the exchange rate (also known as full dollarisation) or a legal mandate that requires the central bank to keep foreign assets at least equal to local currency in circulation and bank reserves (also known as a currency board) (Stone, Anderson, & Veyrune, 2008). The exchange rate towards an anchor currency is therefore totally fixed.

Hard pegged exchange rates aim to ensure sound fiscal and structural policies as well as low inflation. This system has some benefits and drawbacks. Hard pegged exchange rates tend to reduce uncertainty for pricing international transactions as they remain in place for a long time. Nevertheless, since the domestic currency is pegged to the anchor currency, the domestic country cannot adjust the exchange rate and the interest rates. Therefore, domestic central banks have no independent monetary policy (Stone, Anderson, & Veyrune, 2008).

An example of a currency board is the Hong Kong dollar with the US dollar which has remained steady since 1983. An example of a full dollarisation is Panama who uses the US dollar since a long time (Stone, Anderson, & Veyrune, 2008).

#### 2.4.2.3.3 Soft Pegged Exchange Rates

*“That is, currencies that maintain a stable value against an anchor currency or a composite of currencies. The exchange rate can be pegged to the anchor within a narrow (+1 or -1 percent) or a wide (up to +30 or -30 percent) range, and, in some cases, the peg moves up or down over time—usually depending on differences in inflation rates across countries”* (Stone, Anderson, & Veyrune, 2008).

The main difference with hard pegged exchange rates is that soft pegged exchange rates give domestic central banks some flexibility in monetary policy to deal with shocks as the rate is not totally fixed and can fluctuate to a certain extent. Nevertheless, this makes them vulnerable to financial crises resulting in a devaluation of the domestic currency. Soft pegged exchange rates tend to not last very long (Stone, Anderson, & Veyrune, 2008).

China is the major example at point of a pegged monetary system. The Yuan is pegged to the US dollar. The reason behind this choice is that China's currency is relatively weak. A weak currency will favour exports. Since the United States are the first importers of Chinese goods with USD 410.8 billion in 2015, the US dollar is an ideal choice for China. Moreover, since the exchange rate is quite stable, the level of uncertainty is lower, which makes it easier for businesses to plan in the long term (Investopedia, 2016).

### 2.4.3 Conclusion

The international monetary system which is mostly used at the moment is the floating exchange rate. This implies that the exchange rate between foreign currencies fluctuates according to supply and demand. This has many advantages, such as the automatic correction of the balance of trade of countries. However, in such a system, uncertainty around investments and speculation remain.

An international monetary system in today's economy is crucial. With globalisation, international trade increased. An international monetary system is therefore crucial for international trade.

However, the international monetary system is connected to the monetary system. The current international monetary system is based on fiat currencies created in the current monetary systems that float on the exchange market. The question is what will happen to the international monetary system after a likely collapse or an alternative monetary system?

## 2.5 Perspectives

Humanity and the Western world are engaged in a short-term, non-durable way. Climate change, ageing population, high unemployment rate, and immigration crisis all prove it. Those problems concern everyone, no matter their political affiliation. When something like this occurs, a change in behaviour is necessary. Traditionally, governments first use monetary incentives to encourage non-spontaneous behaviour. However, those do not work in this case

because the monetary system is also facing a crisis. The influence of money on the behaviour of economic agents has become part of the problem and not the solution (Lietaer, Arnsperger, Goerner, & Brunnhuber, 2012).

This crisis of monetary system comes at a really bad time. Two crucial deadlines are lying ahead. First, this decade will see baby-boomers retiring, which will exacerbate financial problems arising from pension's payments and healthcare expenses. According to the Bank for International Settlements, by 2020 the debt to GDP ratio will reach more than 300% in Japan, 200% in the United Kingdom and more than 150% in Belgium, France, Ireland and the United States (Cecchetti & Zampolli, 2010). Second, the world of science and industry both agree that massive investments are needed to avoid the worst-case climate change scenarios and enter the "after CO<sub>2</sub> economy". Governments will have to lead the way to introduce those new technologies through considerable subsidies (Lietaer, Arnsperger, Goerner, & Brunnhuber, 2012).

The main issue of the monetary system is "the monopoly of a single type currency created by the banking system through loans attached to positive interest rates (debt)" (Lietaer, What is the problem with our current money system, 2010). It is not diverse enough and is only adapted for transactions in some sectors but not all of them. Some transactions are not favoured by the current system such as the ones within communities. Complementary currencies could compensate for these bottlenecks as they are usually not attached to positive interest rates and thus encourage cooperation between people in given geographically limited societies. They can also allow people to complete transactions that benefit everyone by eliminating or reducing the competitive aspect. Finally, it would make the system more stable as it would rely on currencies which are tailored and adapted to the different and specific transactions (Lietaer, What is the problem with our current money system, 2010).



### Chapter 3: Alternatives

We are currently facing an economic, financial and social crisis which will lead to many challenges in the future. One thing is for sure, markets and their highly sophisticated tools such as sub-primes and swaps should no longer dominate finance as the 2007 crisis has shown magnitude of the risks of a major financial crisis. The subject matter of our thesis are the complementary currencies and how they can help to get rid of the “monoculture” of the monetary system which put the whole economy at risk when trust in the dominant currency is affected. If the euro were to disappear, economic and social consequences would be tremendous. Without claiming to replace official currencies, implementing complementary currencies could to certain limits reduce the negative effects of a major economic crisis. They could also nicely complement the conventional currencies and bring more stability to the current monetary system which may not always be able to deal with major currency problems.

In 2014, more than 6,000 complementary currencies were already in existence around the world (Sobiecki, 2016). Even though they vary greatly, complementary currencies have a common objective: to offer an alternative to money as a classic financial tool and to make money a more social tool, rooted in the real economy and centred on the local exchanges, and reinforce the identity and cohesion of a given area.

Complementary currencies are not the only alternative to classic currencies. We will also discuss the concept of cryptocurrencies such as the Bitcoin, which are based on the blockchain technology. Those cryptocurrencies may help resolving specific challenges as they are decentralised currencies that cannot be controlled by any central authority such as a bank, they could decrease the consequences of abusive behaviour by some central banks that can occur because of their close connection to the political world.

In this chapter we will analyse complementary currencies and cryptocurrencies. As we mentioned earlier, many types of complementary currencies exist and we have made a comprehensive selection that we will discuss in greater detail. The Bitcoin will be used as the main example of cryptocurrencies. We will address the various functions, advantages and disadvantages for both alternatives. We will also discuss the sustainability of complementary currencies based on the blockchain technology. Finally, we will conclude this chapter with a review of opportunities and challenges that complementary currencies may face.

### 3.1 Complementary Currency

As described in the chapter on monetary systems, the viability of the current monetary system is at risk. It made the industrialised era possible but now some changes are required to reach “the after-CO<sub>2</sub> economy”. Nevertheless, the current system is not entirely bad. Even if the system is not perfect, it has shown more potential than any other monetary system for increasing wealth, education and health for many people (Kennedy, Lietaer, & Rogers, *People Money: The Promise of Regional Currencies*, 2012). This chapter will therefore consider how to reduce and/or eliminate the imperfections or drawbacks of the current system.

The current system is lacking when it comes down to tackling highly complex challenges that we are facing such as climate change, ageing population, and their impact on the economy. Some decisions made at the state level turn out to be ineffective because they are not implemented at the right level. For example, creating jobs closer to where (unemployed) people live so that they do not have to move to find work would be efficient and logical. Regional currencies could “enable regions to mobilise their own resources to address regional issues” (Kennedy, Lietaer, & Rogers, *People Money: The Promise of Regional Currencies*, 2012).

Finally, it is important to note that from a regulatory point of view complementary currency are fully compliant in the countries where they have been implemented. They are not competing with national currencies and can sometimes even be integrated by public authorities for local development (Université Virtuelle Environment & Développement Durable, 2016).

#### 3.1.1 Definition

Complementary currencies are not a new phenomenon but they are a potential solution to the drawbacks and limitations of the current monetary and economic system. In an interview, Bernard Lietaer defines complementary currency as “any standardized medium of exchange that people choose to use that is not the national money” (Lietaer, *What about money?* Bernard Lietaer interviewed by Lars Schall, 2012). Thus it means that it is not a legal tender. Complementary currencies are not created by governments but by communities themselves, so it is a bottom-up currency. This decision is motivated by the desire of connecting unused resources with unmet needs. However, a complementary currency has no plans to replace national currencies. Rather, its goal is to bring solutions to the limitations of the national currency and create a more stable monetary system based on different types of currencies with each their own functions and scales. A common misunderstanding is that complementary

currencies are only used locally and in poor regions. Even though it is often the case, initiatives show that it is possible to introduce complementary currencies in poor, rich, urban, rural, and even global areas such as the WIR (Switzerland) or the proposed global currency terra (Lietaer, *What about money?* Bernard Lietaer interviewed by Lars Schall, 2012). Complementary currencies tend to adequately fulfil the function of money as a medium of exchange but not the function of store of value, as their purpose is not to store money.

### 3.1.2 Objectives of a Complementary Currency

Complementary currencies were developed to facilitate exchange, as a response to shortages in the current society model. Hence, objectives of social cohesion, sustainable development, and support to local businesses, are often linked to complementary currencies. Therefore, complementary currencies do not only have an economic side but they also consider the social and environmental dimensions. The social dimension comes in the form of a development of social interactions and intergenerational connections. This is exactly the objective in “local exchange trading system” (LETS) based projects. The economic dimension aims to support the local economy and keep wealth inside the community by encouraging local production and consumption. The purpose of circulating currency system is aligned with this objective. Finally, the environmental aspect makes people change their consumption and production behaviour (Blanc, 2012).

The type of objectives varies according to local issues and economic network possibilities in the area. Complementary currencies can tackle various goals such as: supporting the local economy, increasing the purchasing power of the less wealthy, reinforcing short circuits between producers and consumers, supporting the local businesses, providing financial support to local organisations, reinforcing social links, increasing mutual learning, supporting organic and sustainable agriculture, developing intergenerational relationships, reinforcing the identity and increasing wellbeing in a region (Attout, et al., 2013).

### 3.1.3 Cooperative Economy

Cooperative economy, also called social or solidarity economy is a new economic model that closes the gap between two seemingly incompatible principles which are social responsibility and market economy needs. In this economy, companies work in the current market according to new principles such as diversity and inclusiveness. These initiatives improve social capital by allocating financial capital to fulfil the local (unmet) needs of the people. In the current

economy, the competitive economy addresses these problems by funding programs that are themselves financed through taxes. The cooperative economy could reduce or fix certain inefficiencies like unemployment, and result in a reduction of the tax rates. In the long term, social economy might create local jobs and business opportunities and reduce the cost of the unemployment benefits system by encouraging innovation, inclusiveness in the job market, and new co-operative models. These initiatives could even become self-funding so that they would not depend on any subsidies or taxes and would tackle social problems (Kennedy, Lietaer, & Rogers, *People Money: The Promise of Regional Currencies*, 2012).

The complementary currencies, as non-competitive and non scarce currencies aim to support the social economy which would stabilise and offer a more human approach than the current economic and monetary system. They would also reduce the monopoly of the conventional currency and increase the relative power of cooperative economy towards the competitive economy.

#### 3.1.4 Complementary Cooperative System

With complementary currencies rising, the change is not only in the monetary system but also in the related behaviours. People involved in a well-managed barter system show more cooperative behaviours than in conventional systems. People also show more solidarity to the associations they support when they are not using conventional currency. People can offer “time credit” or other regional currencies that support their region or community at the same time. Furthermore, local initiatives could take advantage of unused resources in communities such as talented people, or abandoned buildings, by connecting them with unmet needs and demands through a non-competitive currency which they issue themselves (Kennedy, Lietaer, & Rogers, *People Money: The Promise of Regional Currencies*, 2012).

#### 3.1.5 Main Types of Complementary Currencies

Complementary currency is a term that encompasses several types of currencies which have their own function and purpose. Two main types of complementary currencies are based on their purpose: commercial-oriented and community-oriented currencies (Kennedy, Lietaer, & Rogers, *People Money: The Promise of Regional Currencies*, 2012).

### 3.1.5.1 Commercial-oriented

These kinds of complementary currencies with a commercial goal are already well-known to the public. This includes air miles issued by airlines to increase customer loyalty by redeeming free airplane tickets allowing the airlines to file their unused resources which in their case are empty seats.

Another commercial-oriented complementary currency is at the root of the “business to business exchange network” on a “business to consumer network” such as the RES initiative in Belgium which we will discuss later in this chapter as well as in the next one (Kennedy, Lietaer, & Rogers, *People Money: The Promise of Regional Currencies*, 2012). They are organisations that aim to connect their members and facilitate transactions between them who can be individuals or businesses. It also serves as a clearing house by recording all the transactions and monitoring the account balances of its members (Murray, 2016).

### 3.1.5.2 Community-oriented

Community-oriented currencies have as main objective to improve the community and make people take part in social and environmental activities. This includes “local exchange trading systems” (LETS) and time banks (Kennedy, Lietaer, & Rogers, *People Money: The Promise of Regional Currencies*, 2012).

LETS is “a locally organized economic organization that allows members to participate in the exchange of goods and services among others in the group” (Investopedia, 2017). This system is based on a complementary currency that can be exchanged for goods and services. This type of organisation aims to maximise its profit with activities that benefit their members and community.

Time banking introduces an alternative monetary system where the value comes from units of time and not from items like commodities or money. Usually, one unit is equivalent to one hour of labour (Investopedia, 2017). The time bank is not a new concept and is especially popular in periods of economic downturn. It allows communities to benefit from the unused skills and potential of their members. Here, citizens and their skills are valued for their contribution to the community (FMDV, 2014).

### 3.1.6 Regional Currency

Regional currencies are not new. They were used in the past but their number declined when central authorities started creating a monetary system by issuing their own national currencies. History proves that regional currencies were a great success and that communities could live in a totally autonomous fashion (Kennedy, Lietaer, & Rogers, *People Money: The Promise of Regional Currencies*, 2012).

#### 3.1.6.1 Definition

Regional currency is a type of complementary currency. A regional currency is “an agreement within the community of a region to accept something other than legal tender as a means of payment. It connects unused resources with unmet needs at the regional level” (Kennedy, Lietaer, & Rogers, *People Money: The Promise of Regional Currencies*, 2012). Its characteristics are the same as a complementary currency except that they are geographically limited to a region. There are two ways regional currencies can expand. They can start small as a local system and expand to an entire region later. Or they can immediately serve the region (Kennedy, Lietaer, & Rogers, *People Money: The Promise of Regional Currencies*, 2012).

#### 3.1.6.2 Most Common Elements

Through his years of research, Bernard Lietaer has identified three major “building-blocks” or elements of a sustainable regional currency.

➤ “Voucher system or circulating currency”

These systems offer cash currency or other digital accounts for small, daily amounts transactions. However, these structures can vary depending on their purpose. Currencies can be: 1) backed by the national currency at a 1:1 ratio, 2) backed by the promise to deliver the goods or services, 3) traded for an exchange rate or reward, or 4) in some systems, transferred from an account to an “exchange ring” (Kennedy, Lietaer, & Rogers, *People Money: The Promise of Regional Currencies*, 2012).

This system comes with several benefits. Some people may feel more comfortable with a tangible currency when exchanging goods and services, or measuring or storing value. The system can also increase its visibility. Existing businesses are more confident in a regional currency which is backed by the national currency. However, critics of this system say that because it is backed by the national currency, it is tied to the national currency. In this system,

the regional currency only takes over the national currency for short time before being replaced again by the national currency. Finally, systems that are only based on circulating currency increase awareness but their impact on the economy is still small (Kennedy, Lietaer, & Rogers, *People Money: The Promise of Regional Currencies*, 2012).

➤ “Exchange ring”

This system creates cash-free transactions and establishes mutual credit tools between individuals and corporations. This allows individuals and small to medium companies to easily access credits. In this system, “money” is created when goods and services are exchanged between participants. The seller receives a positive balance for the goods or services he has sold and the buyer a negative balance. Thus, in theory, the added balance of all participants should be zero. However, in practice, people can leave the system with a positive or negative balance. Fees can be charged for system maintenance, through a credit issue or a time limit for reimbursing negative accounts. The mechanism is a database maintained by a centralised administration system that records all participant transactions in full transparency, which means that all participants can see each other’s transactions. In some systems such as Banco Palmas, even regional taxes can be paid through the regional currency. Both commercial and community exchange rings exist, such as barter networks and community-based time banks or local exchange frameworks (Kennedy, Lietaer, & Rogers, *People Money: The Promise of Regional Currencies*, 2012).

There are several benefits to this system. First, since *money* is not backed by national currency but by goods and services, participants can save their national currencies for other purposes. Second, the medium of exchange will always meet the participant’s needs as it is created and backed by the goods and services of the transaction. Major social economic players of the region are also involved, but also volunteer associations, local inhabitants, small and medium-sized companies and local authorities. It also creates a connection between active members of the system and offers cheaper and more adapted services. A good example is the WIR, a regional currency with an “account-based mutual credit system” that has been around for more than 80 years without any circulating currency. However, the high transparency of the system can be a problem for companies who might not want their accounts seen by everyone (Kennedy, Lietaer, & Rogers, *People Money: The Promise of Regional Currencies*, 2012).

➤ “Micro-credit bank”

A micro-credit bank is a financial institution which offers low or zero interest loans for consumption and production. (Kennedy, Lietaer, & Rogers, *People Money: The Promise of Regional Currencies*, 2012).

Each element has its pros and cons. Some initiatives, such as Banco Palmas and the WIR offer a combination of two elements. Banco Palmas has a micro-credit bank and a currency. In contrast, the WIR has a micro-credit bank and an exchange ring. However, a system including those three elements would show a high degree of flexibility (Kennedy, Lietaer, & Rogers, *People Money: The Promise of Regional Currencies*, 2012).

Finally, cooperation is also possible between regional currency systems and financial organisations. Many initiatives in different countries already operate with financial institutions. Usually, these institutions are cooperative banks, rather than branches of large commercial institutions. These partnerships can help regional currencies in their implementation as well as their day to day operations and back-office (Kennedy, Lietaer, & Rogers, *People Money: The Promise of Regional Currencies*, 2012).

### 3.1.7 Examples

#### 3.1.7.1 Banco Palmas

In Fortaleza, one of the biggest cities in the Northeast of Brazil, a Brazilian favela called Conjunto Palmeiras saw its citizens create their own bank and currency from scratch. The history of that community who had no economic background went viral and is now replicated nationwide.

##### ➤ Context

Everything started in 1973 when some people, mostly fishermen, were evicted from their house on the coast to make way for holiday resorts. They built their new homes in Fortaleza in the Northeast of Brazil which became a favela with no schools, no access to electricity or water, no hospitals nor any other public services. To improve their situation, the citizens created an association called “Asmoconp” in 1981. Through various partnerships and popular mobilisations, the organisation developed the area with community support in mind. Despite the urban progress, the neighbourhood was still suffering from poverty and hunger. At the question “Why are we poor?”, they all responded “Because we have no money”. After a survey,

the organisation concluded: “we find wealth inside of the favela but it flees away to other places instead to be reinvested locally” (Attout, et al., 2013).

In 1998, the citizens of Asmoconp decided to create a cooperative bank called “Banco Palmas” to make the circulation of income easier inside the community. Through a modest local fund, Banco Palmas started to loan microcredits to local companies and consumers. It started with 800 euros from a French organisation but was already bankrupt on the second day after granting five credits to economic agents and for the consumption of 20 families. After that, international organisations lent money to the bank to increase its micro-credit capacity (Kennedy, Lietaer, & Rogers, *People Money: The Promise of Regional Currencies*, 2012).

In 2002, citizens decided to regain control over the economic system by creating a complementary currency called the “Palmas”. The Palmas system supports activities which create wealth and employment by keeping exchanges local and by maintaining wealth inside the favela. The money is used by both professionals and individuals to develop activities inside and outside the network.

#### ➤ Description

The Palmas has a value equivalent to, and is backed by, the national currency. Only businesses can convert Palmas into national currency subjected to a small tax. A wide variety of products can be bought with Palmas. These products can also be found outside the network, so economic agents are not forced to use Palmas. The money is issued proportionally to credit demand and conversion demand into national currency (de Melo Neto, 2011).

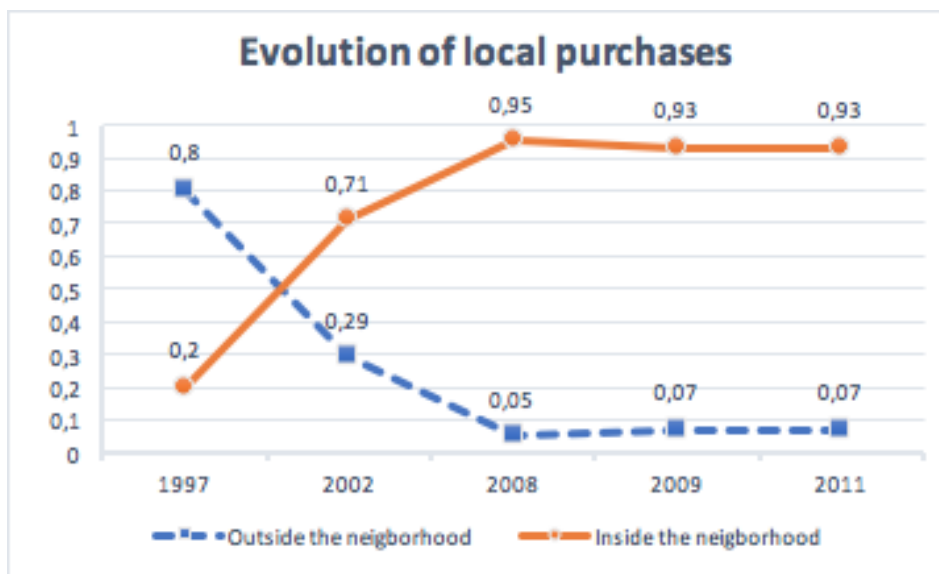
The system is a combination of microcredits which provide a local currency to consumers and local producers, and support programs for those in need. These programs focus on socio-economic integration, return to employment, development of local economies, creation of cooperatives, and implementation of a network of merchants and producers. Banco Palmas grants two types of microcredits: microcredits for consumers with no interest rates and microcredits for businesses with a small positive interest rate. To be able to apply for a microcredit, the economic agent must be a member of the neighbourhood association. Microcredits are not the only way to acquire Palmas. Economic agents can ask for a part of their salary to be paid in Palmas. People can also exchange national currency for Palmas. The Palmas is not a melting currency which means that its value does not depreciate over time (Attout, et al., 2013). The bank also offers services such as credit cards to promote local consumption, micro-insurance for businesses, and helps people and businesses understand the

benefits of the supportive economy. The Palmas is accepted in more than 240 businesses who offer discounts from 5% to 20% for those who buy goods and services with Palmas. Once again, the purpose is to encourage the circulation of money within the favela eventually leading to wealth and employment in the favela. This system is controlled by the local socio-economic forum (Fecol). Citizens who are interested can meet every Wednesday and discuss improvements to the system (de Melo Neto, 2011).

We should note that the founder of Banco Palmas, Joaquim Melo, was charged for money laundering on following a complaint by the central bank. In the lawsuit that followed, the judge dismissed the charges and stated that access to finance was a constitutional right. The judge made a comment that the central bank was not involved in actions for helping poor people and that they had therefore no right to complain about the activities of Joaquim Melo. Following this, the central bank offered Joaquim Melo to be involved in group discussions about helping poor people. In 2005, the Palmas Institute was established to help other communities launch their own bank and money based on the Palmas model. Now, people can even pay their local taxes in Palmas directly from their Banco Palmas bankaccount (Kennedy, Lietaer, & Rogers, *People Money: The Promise of Regional Currencies*, 2012).

#### ➤ Impact

In 2011, after eleven years, Banco Palmas had an account balance of 3 million real (the national Brazilian currency). Between January and September 2011, Banco Palmas granted more than 4 million in loans to 3,000 families. Furthermore, 1,500 credits were attributed to poor women as part of the *Bosla familia* program. The bank also created a socio-productive integration project for them. The Minister of Labour and Employment conducted a survey on Banco Palmas with the following results: 90% of people interviewed said that Banco Palmas increased their quality of life; 26% increased their income; 22% found a job; 1,900 jobs were created; and local businesses sales increased by 30%. The following graph shows the evolution of local purchases. We can see that micro-credits in Palmas allowed wealth to remain inside the community, reduced transportation costs and CO<sub>2</sub> emissions. These results confirm that this complementary currency fulfils its objectives of supporting the local community and protect the environment.



Source: (de Melo Neto, 2011).

These positive results led to the creation of 66 community banks in rural areas in Brazil. The network continued to grow even during the economic crisis. This model based on a social local control has already helped more than 300,000 consumers and producers. There is still a lot of work ahead as more than 79 million Brazilians are excluded from the financial system (de Melo Neto, 2011). Finally, Banco Palmas is the best example of a poor area using a complementary currency to improve its situation (Kennedy, Lietaer, & Rogers, *People Money: The Promise of Regional Currencies*, 2012).

### 3.1.7.2 WIR

“WIR” means “we” in German and is short for “Wirtschaftsring” which can be translated as “economic circle” and is the most successful complementary currency. It was issued in 1934 by the WIR Cooperative as a response to the 1929 economic depression (Kennedy, Lietaer, & Rogers, *People Money: The Promise of Regional Currencies*, 2012).

#### ➤ Context

After the economic depression, sixteen people in Switzerland decided to fix the problems caused by the crisis: high unemployment, accumulation of money, protectionism and high consumer and business uncertainty. They decided to create their own interest-free currency as a response to the scarce national currency. Public reaction was mixed. Many people were interested but other people thought it was an old concept which would not fit in the current economy. Since then, the system proved to be a useful and stabilising feature of the current Swiss economy. In 2010, 60,000 businesses traded in WIR francs, which accounts for 16% of

all Swiss companies (Kennedy, Lietaer, & Rogers, *People Money: The Promise of Regional Currencies*, 2012).

➤ Description

The WIR is based on a “exchange ring” and a “micro-credit bank”. Members sell goods and services in exchange for a positive balance. Buyers are attributed a negative balance for these goods and services. This creates a community of positive and negative balance trades. Consequently, there is no direct liability between economic agents. The WIR Bank, as a third party, records all transactions and balances. This allows businesses to avoid using the national currency as a method of payment. Transactions can be made through checks, credit cards and the Internet (Kennedy, Lietaer, & Rogers, *People Money: The Promise of Regional Currencies*, 2012). WIR payments can now be made with a smartphone, through the WIRpay application (Banque WIR soc. coop., 2017).

Members can access an internal database and see the goods and services offered by businesses as well as the price, which can be paid in whole or in part in WIR francs. The WIR franc is equivalent to the Swiss franc and can be used by businesses for: 1) buying goods, 2) business expenses, 3) capital and private expenditure, 4) employee salaries. The WIR network and its trading account are open to any business of any size. Memberships for individuals became unavailable in 1958 because too few people were registered. Until 1948, the WIR franc progressively lost value because of a “demurrage” fee. This served as an incentive to boost consumption and circulation of money. However, members decided to cancel this fee due to its complicated aspect (Kennedy, Lietaer, & Rogers, *People Money: The Promise of Regional Currencies*, 2012).

After two years, only SMEs (the system considers a company to be an SME if it has less than 250 employees) are eligible to become “fully registered members” of the WIR. The full membership allows companies to acquire shares and obtain voting rights as well as a small yearly dividend from their shares. This full voting membership fulfils the main purpose of the system which is to serve the interests of SMEs. Other members are called “silent members” (Kennedy, Lietaer, & Rogers, *People Money: The Promise of Regional Currencies*, 2012).

On top of its exchange ring system, the WIR expanded into a banking business in 1998. It offered more financial services to its members and became the WIR Bank which is however not involved in risky financial products. The WIR Bank issues loans with small interest rates to cover administrative costs and maintain dividends. The Bank does not make excessive profits

and offers advice and budgeting services as well as workshops to its members. The network is an undeniable marketing tool for businesses as it brings them together and allows them to raise awareness from potential clients and suppliers (Kennedy, Lietaer, & Rogers, *People Money: The Promise of Regional Currencies*, 2012).

The WIR is based on cooperation and mutual help through well-defined attitudes and rules. They helped the cooperative banish a few members who tried to abuse the system (Kennedy, Lietaer, & Rogers, *People Money: The Promise of Regional Currencies*, 2012).

#### ➤ Impact

Even though the amount of WIR transactions is marginal compared to the national turnover – around 0.32% of the Swiss GDP – it has a significant impact on the economy. Data collected over 50 years show that the WIR exchange ring has stabilised the economy. In times of depression and economic downturn, WIR activities boomed and the turnover growth was higher than the national average, for several reasons. There first was a “volume leverage effect”. Some transactions are only possible through the WIR. For example, if a person wants to buy a parcel of land valued at 1 million Swiss francs, the transaction can only happen if the person is able to pay 80% of the price in Swiss francs and the remaining 20% in WIR francs. The impact of the WIR transaction has increased fivefold in the overall Swiss economy and the WIR transactions have increased during periods of downturn, giving people an alternative to national currency transactions. Finally, this system mainly benefits SMEs, which represent 85% of all employment in Switzerland (Kennedy, Lietaer, & Rogers, *People Money: The Promise of Regional Currencies*, 2012).

The WIR system is a good example of the stabilising effect of complementary currencies. As the initiatives benefit the economy they should be encouraged by the central bank and politicians.

#### 3.1.7.3 C3: “Commercial Credit Circuits”

By granting each other mutual credit, a network of companies favours mutual aid and business development, leading to another type of complementary currency: the so-called C3.

#### ➤ Context

In 2005, C3 was created in Brazil to compensate for a lack of liquidity of SMEs which is a real issue for them. SMEs are pressured to pay their suppliers within thirty days while their clients, especially when they are big companies, only pay after three months. Without sufficient

liquidity, SMEs must resort to a credit line. The problem is that banks only offer a credit line with very high interest rates or disproportionate security deposits (Lietaer, Glossary, 2010). When there is a shortage on the market, C3 provides liquidity to SMEs to generate commercial transactions. It is a new tool designed to encourage SME activity and reinforce the local economy and employment. Therefore, the goal of that complementary currency is above all economic and commercial. The project is supported by important partners like the Brazilian and Uruguayan governments, energy suppliers, phone operators and transport companies. This support allows new members to be offered sufficient credits to develop their activities. An SME asking for a credit line in complementary currency will have less trouble convincing its suppliers since it will benefit the network and create other business opportunities (Attout, et al., 2013).

#### ➤ Description

In Brazil, C3 is a total electronic melting money (its value decreases by 1% per month) which transits on a semi-closed network, and which can be converted into either the national currency or the often-used US dollar. Users are encouraged to keep the money in the circuit through a 3% to 7% reconversion tax. By contrast, businesses that decide to make use of the complementary currency receive a conversion bonus of 3% a month. C3 money from one participating local community can also be converted in C3 money from other participating communities.

In the C3 network, what is considered as credit is nothing but an exchange system in a complementary currency where an account can be negative. Moreover, if the supplier and the customer are both in the system, payment is automatic and immediate.

To obtain that complementary currency, businesses can carry out a transfer in national currency or have to provide a guarantee such as a purchase order or a credit note. They then receive the equivalent amount in C3 in a bank account opened for them. The national currency that was transferred will then be reinvested in loans, which are available at a reduced interest rate to other C3 users. Users can also pay suppliers or offer goods and services in C3. The network operates through three channels: the internet, mobile phones and electronic payment cards. C3 users give 0.1% of their profit to the Social Trade Organisation foundation (STRO) which is responsible for the network. The STRO will use that money to invest in projects that support C3 (Attout, et al., 2013).

### ➤ Impact

The C3 method has a positive impact on companies, public authorities and banks:

- Participants have easy access to short-term funds anytime. Therefore, they can increase their production capacity at a lower cost than with a traditional loan from the bank.
- Suppliers are paid immediately, regardless of the payment date of their invoice. Hence, liquidities are injected in the network of SMEs at low cost. Access to those liquidities makes C3 attractive to SMEs.
- The technology necessary for the functioning of the network already exists. No new laws or agreements are required, which makes it easy to develop. The latest technologies are especially used for e-commerce.
- Benefits for public authorities
  - They will collect additional taxes as more transactions are made.
  - The C3 method is a reliable way to reduce local unemployment without costly subsidies.
  - Participating companies in the community maintain a balanced relationship between them which stimulates local economy.
- Positive effect for banks
  - As it is a computerised network, intervention of insurance companies and banks is facilitated. The market of SMEs becomes more interesting for banks if credit lines can be negotiated with the whole compensation network without having to engage with each SME. It also offers a better diversification of risks for the banks.

#### 3.1.7.4 Toreke

Toreke is a complementary currency that was established in the poorest neighbourhood of Ghent. It is a circulating paper currency that was created in 2010 to promote ecological and health activities. The term “Torekes” means little tower in Flemish and refers to the social apartment towers in the neighbourhood (Lietaer, Arnsperger, Goerner, & Brunnhuber, 2012).

### ➤ Context

Rabot is the poorest neighbourhood in Ghent. Half the population are first-generation immigrants. 25 different languages are spoken in the area, Turkish being at the top.

The project started with a simple survey asking the population what they wanted most. A majority answered that they would like to have a small garden so that they could grow vegetables and flowers.

Consequently, an abandoned field from a company that went bankrupt was made available to the local community to organise their gardens. The rent is 150 Torekes a year (Lietaer, Arnsperger, Goerner, & Brunnhuber, 2012).

➤ Description

Toreke is a paper circulating currency issued with the cooperation of the city of Ghent, which was introduced to meet the wishes of the local population and to enhance the neighbourhood. The Torekes are gained by the population if they proceed with certain neighbourhood enhancement actions such as taking care of gardens, cleaning up the public domain, etc ... Those activities are managed and controlled by the local community, the local public authority and several local NGOs.

Torekes can be used to rent a public garden, to buy specific goods such as vegetables or low-energy lamps at local shops, to purchase movie tickets and public transportation tickets.

The local authority allows businesses to exchange their Torekes into euros. This money come from the existing budget of the city of Ghent allocated to the neighbourhood (Lietaer, Arnsperger, Goerner, & Brunnhuber, 2012).

➤ Impact

There is one problem with this project: there are too many volunteers for the proposed activities. This means that the project has motivated and included many inhabitants.

In the first year of the project, 50,259 Torekes were earned as a result of 526 different projects. It created a real incentive for people to take part in neiboorhoud enhancing activities (Lietaer, Arnsperger, Goerner, & Brunnhuber, 2012).

### 3.1.7.5 RES

RES is an alternative monetary system based on a complementary currency, which was established in 1996 in Leuven. The system offers additional support to local shops, entrepreneurs and local SMEs located in Belgium.

➤ Context

The RES system aims at providing solutions and additional support to the local economy in response to difficulties resulting from the current monetary system.

➤ Description

The system is based on an internal and legal complementary currency. The currency is only applicable in the RES network. This creates an incentive for members to purchase within the RES network. The RES network is open to any local SME located in Belgium, ranging from bakeries, to renting of real estate. Multinational companies are excluded from the network. One RES is worth one euro. It is a digital currency that cannot be exchanged into euros. This is an important feature because it means that businesses can only accept a certain RES amount that is in line with the amount of purchases they will make in the RES network. This ensures that money remains in the local economy by keeping it in the RES network (RES, 2017).

Businesses agree to be paid, partially or fully, in RES. People who want to make a purchase in RES must obtain a prepaid RES card and upload it. By paying in RES, people support the local economy. The cooperative offers advantages such as attractive exchange rates from euro to RES. Currently, 50% additional RES are added to the account with every top up (RES, 2017).

➤ Impact

The system promises that the profit margin of members will increase by 3 to 5% through many benefits such as a fast-growing customer base and RES loans with no interest rates. The network currently counts 5,000 business members from various sectors (RES, 2017).

The system works well, 274,021 transactions were recorded in 2016 valued at 42,768,356.49 RES. There is also a significant growth of new accounts. In 2016 there was an increase of 17.48% (RES, 2017).

### 3.1.7.6 Swiss Cross Drachma

The Swiss Cross Drachma is a complementary currency circulating in a refugee camp in the Greek island Lesbos. The complementary currency only circulates within the refugee camp, called the Swiss Cross Community centre, and in a few other places on the island.

➤ Context

Since 2015, the increasing conflicts in different regions of the world led many people to become refugees in Europe. After long journeys over land and water, many of the refugees arrived on

the Greek island Lesbos and were placed in camps such as the Moria or the Swiss Cross Community centre. A volunteer in the Swiss Cross Community centre and ex-banker named Fabian Bracher asked refugees what they needed in the camp. Many of them answered that they did not need clothes, shoes or charity, but some normality and dignity. Fabian Bracher then decided to develop a complementary currency that could only be used by refugees in the camp and its surroundings. The Swiss Cross Drachma allows them to choose what they want to do by spending the currency for what they need or want and avoiding that the allowances are given to human trafficking organizations (Kourounis, 2017).

➤ Description

Every day, each refugee receives two Swiss Cross Drachma, which can be used to go to the hairdresser, or buy cigarettes, clothes, or coffee. Swiss Cross Drachma can also be used in bars or restaurants on the island. Every service inside the community is worth one Swiss Cross Drachma. This type of complementary currency has clear social goals (Kourounis, 2017).

➤ Impact

The impact of the Swiss Cross Drachma is most significant among refugees because it gives them a level of dignity and independence which it is what they desire.

### 3.1.7.7 Bristol Pound

The Bristol Pound is a complementary currency created in 2012 only usable in Bristol. Its aim is to boost the local economy by making it greener, fairer and stronger (Bristol Pound, 2017).

➤ Context

The developers wanted to implement a local exchange system to counter the outflow of money from Bristol. As soon as money was spent in the city, most of it left the city. The implementation of the Bristol Pound is a way to keep the money inside the city. The Bristol Pound also tends to improve social interactions by combining shopping with meeting people.

➤ Description

The Bristol Pound is a digital and paper currency. The digital accounts are monitored by a regulated financial institution called the Bristol Pound Union. Paper money is printed by specialised institutions and includes eight different security features. In short, the Bristol pound is a very secure currency (Bristol Pound, 2017).

The transactions can happen through a physical exchange of paper Bristol Pounds or through electronic transactions, via either a mobile phone exchange system called Txt2Pay, or via the Internet. The Txt2Pay method replaces the debit or credit card system and allows people to make transactions in Bristol Pounds by exchanging them with their mobile phone. People in the city can open an account, which is monitored by the Bristol Credit Union. The Bristol Credit Union is also responsible for deposits of British Pounds and exchange between the British and Bristol Pound. It also offers financial services to people living in the former Avon County neighbourhood, regardless of their income. People can join by making a minimum of £1 deposit on their account. The Bristol Credit Union is managed by volunteers. The Bristol Pound offers multiple benefits to local businesses such as free promotion and marketing via the website, and a secure, low-cost electronic payment tool via Txt2Pay. However, payments are charged a 1% fee for online transfers and 2% for Txt2Pay (Bristol Pound, 2017).

British pounds can be exchange into paper Bristol Pounds in cash points or by transferring Bristol Pounds via Txt2Pay and withdrawing it. The rate between British and Bristol Pound is 1:1. Each Bristol Pound is backed by a British pound. Bristol Pounds can be used to pay suppliers and business rates to Bristol City Council or partially pay employees (Bristol Pound, 2017). Printed Bristol Pounds cannot be exchanged directly into British pounds. Bristol Pounds account holders can do it indirectly at no cost. The community just asks people to try and spend as much Bristol Pounds as possible rather than exchanging them back into British Pounds as it will decrease the effects of the system and allow money to leak out of Bristol (Bristol Pound, 2017).

#### ➤ Impact

This system keeps money in Bristol by using it locally. The British pound can easily leave the country and be held in some tax haven account or on a shareholder bank account, while the Bristol Pound stays in Bristol and thus contributes to the local economy. Spending Bristol Pounds allows people to support the local economy and to get closer to local businesses (Bristol Pound, 2017).

#### 3.1.7.8 TradeNow

Many alternative systems payment have been implemented in response to the extreme consequences of the 2007 economic crisis, such as barter networks in Greece.

### ➤ Context

Because of the economic depression in Greece, barter networks as alternative systems have become more popular. Around 200 alternative networks, such as TradeNow, have been implemented in the country. The development of this trend is linked to the scarcity of national currency, especially in times of economic downturns. For example, in Greece, in the summer of 2015, cash withdrawals were limited to 60 euros per person per day (Ismailidou, 2016).

### ➤ Description

One of the best examples of a Greek barter system is TradeNow which was created in 2012. It is a digital platform that allows its members to easily barter goods and services between them. The goods and services are valued in an internal complementary currency called Trade Point which has an equivalent value to the euro. Trade Points can be obtained by exchanging euro or by earning them as rewards for being an active member on the platform. Members can choose to exchange their goods or services for Trade Points or for other goods and services. Trade Points can be used to purchase other goods or services and to complete transactions when there is a difference in value between goods. The platform provides an “automated matching system” that connects members according to their needs (TradeNow, 2014). Finally, Trade Points cannot be exchanged into euros to ensure that the money remains in the barter system.



**Source:** (Ismailidou, 2016).

### ➤ Impact

TradeNow benefits individuals and businesses. It allows people to trade their unused goods for desirable items and thus reduces waste. It also creates interactions between members. Businesses can promote their products and services by publishing them on the TradeNow website. It gives them an opportunity to increase their sales through new customers and partners. Finally, businesses can maximise their resources by trading unused items (TradeNow, 2014).

Barter systems in general help people acquire goods and services by exchanging unused items or offering services. It is an alternative to traditional trade and becomes especially useful in times of economic depressions when conventional currency is scarce. Another benefit of the barter systems is that it encourages social interactions and connections among the population. Finally, it extends the life of goods that would otherwise be discarded. It is therefore better from an ecological point of view as it reduces waste and overconsumption.

#### 3.1.7.9 Fureai Kippu

Fureai Kippu or “caring relationship tickets” was created in 1994 by Tsutomu Hotta, and is the most important service sector organisation in Japan. It is the largest time bank in the world. Fureai Kippu supports elderly and disabled people in Japan’s defective healthcare system. This time bank proves beneficial and could serve as a role model for other countries.

### ➤ Context

Japan has been considered an ageing country by the United Nations since 1970. Today, Japan faces a major age crisis. Among OECD countries, it is the one with the fastest growing old age population. As an illustration, 25% of the population is 65 or older. This will be 36% in 2040. Life expectancy is 84.46 years, and the country already totals 67,000 centenarians (Dupont, 2015).

As we mentioned earlier, two major challenges of the decades are: climate change and ageing population. The increasing cost of healthcare is already a source of financial troubles in Japan. The government faces another preoccupation, cultural this time, called “muen shakai” which is the absence of relations between people which leads to isolation, especially of elderly people. Finally, the relation between children and parents is becoming more distant, whereas children

traditionnely used to take care of their parents. All these issues led Tsutomu Hotta to create the Fureai Kippu (Dupont, 2015).

➤ Description

Fureai Kippu is a mutual, local help network which raises awareness of volunteering to tackle the economic and social challenges mentioned above. The goal is to cover the portion of care for elderly or invalid people that are not covered by insurance such as meals, transport and groceries.

The system is based on credits and is 100% computerised which makes providing and recording small services easy. One hour of service is the basic unit of the Fureai Kippu (FK) but different services have different rates. One hour of groceries is worth one FK while one hour of care is worth two. The only way to earn FK is by contributing time to help elderly or disabled people in need. Those units of time are deposited on an electronic savings account and can be saved for personal use or transferred to another person. FK can only be used for the services mentioned above.

Of the 374 organisations which form the Fureai Kippu, the most important one is the Nippon Active Life Club which has 37,500 members and is active in 137 communities. Hundreds of thousands of people benefit from the Fureai Kippu system (Dupont, 2015).

➤ Impact

Fureai Kippu has major benefits. It allows elderly people to stay at home and keep a certain independence. Studies showed several positive effects, like promoting social interaction with vulnerable people and allowing volunteers to be compensated for the time they spend helping others, and creates intergenerational solidarity. Also, people inside the system describe it as more authentic and more human which is very important, especially for the elderly people. However, some aspects like collaboration between local authorities, volunteers and organisations still need improvement. The system is also asymmetric because some elderly people are too old to be able to offer a service in return. This system could be one of the solutions to ageing population (Dupont, 2015).

On top of these existing examples of complementary currency systems, other meaningful projects are under way. We have decided to discuss below their advantages and limitations including potential impact and the problems they help to solve.

### 3.1.7.10 Biwa Kippu

The Biwa Kippu is a complementary currency project in Japan which aims to improve the environmental situation of the lake Biwa Kippu. It is not yet in force.

#### ➤ Context

Biwa Kippu is a lake in the Shiga region in Japan and is one of the oldest lakes in the world. The ecosystem of the lake is under serious environmental threat because of the problem with its source in the surrounding forest and because of industrial pollution. Regional authorities were looking for a way to improve the environmental situation of the region without additional public funds.

The Biwa Kippu project wants to motivate citizens and associations of the region to change their behaviour. People would receive Biwa Kippu for taking part in environmental programs. Each Biwa Kippu corresponds to one hour of activity. People could carry out transaction between them with the Biwa Kippu through a local computerised exchange (Lietaer, Arnsperger, Goerner, & Brunnhuber, 2012).

#### ➤ Description

The main goal of Biwa Kippu is clearly environmental since authorities want to decrease pollution levels and protect the source of the lake. The only way for people to acquire Biwa Kippu is to take part in environmental programs. Some participation shall be mandatory but the rest will be optional. Every Biwa Kippu is worth one hour of work and could not be exchanged into yens. Biwa Kippu cannot be purchased with yen either, thus the only way to acquire them is to work for the project. As soon as enough Biwa Kippu shall be circulating, people will be able to create a local computerised exchange between them (Lietaer, Arnsperger, Goerner, & Brunnhuber, 2012).

#### ➤ Impact

As Biwa Kippu is still a project, the potential impact is theoretical and depends on various factors like the level of participation. However, it could have the following impact on the local economy and the region:

- Being able to set up environmental programs at a very low cost.
- Raise awareness of the importance of the lake and its preservation.
- Biwa Kippu could be an alternative form of income for people and organisations.

- The quality of the environment would improve.
- As they are part of the project, people could see the achievements in real time which will motivate them all the more (Lietaer, Arnsperger, Goerner, & Brunnhuber, 2012).

### 3.1.7.11 Trade Reference Currency (TRC)

TRC was launched in 2001 and is a project of international complementary currency for international firms.

#### ➤ Context

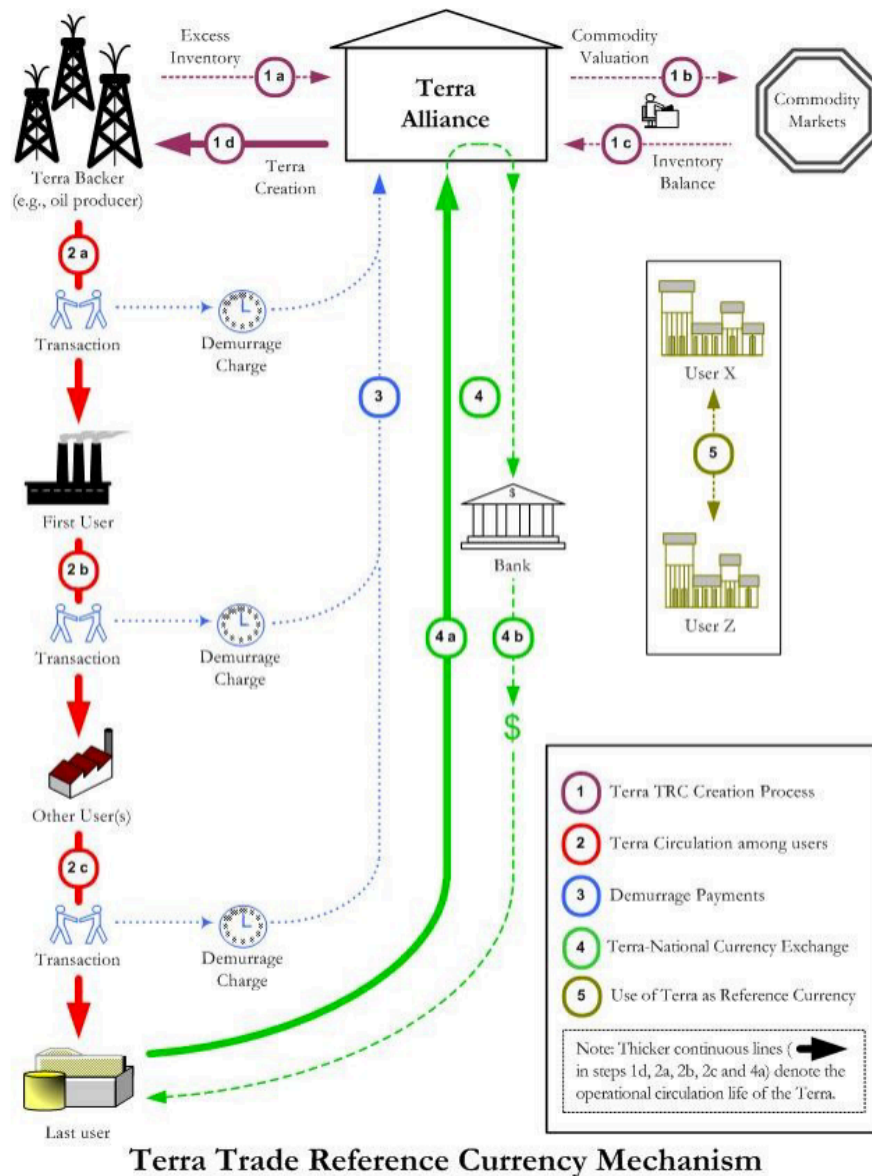
Monetary instability is the main concern of international firms as it represents a very high risk for international trade. We have discussed the exchange market and its context hereabove in this thesis.

#### ➤ Characteristics of TRC

- Complementary currency. TRC, like the other examples, is designed to circulate alongside the national currency. Therefore, it would not affect financial and monetary practices.
- Trade reference currency. This money would be based on an adapted gold standard. Instead of being only backed by gold, TRC would be backed by a basket of the most important commodities and services on the global market.
- Private alliance. The alliance is responsible for issuing inventory receipts. It will play an intermediary role between producers and holders of inventory receipts, which are also called TRC.
- Demurrage-charges. To encourage circulation of money, a tax of 3.5 to 4% a year is applied if the money is not used. This corresponds to the cost of storing the different goods that are in the basket. The goal here is to boost commercial exchanges and investments. When such a charge is applied, the currency does not fulfil its function of store of value.
- Inflation resistant. Because TRC is built from a carefully thought-out basket of goods, it would be less inflation-sensitive (Lietaer, Arnsperger, Goerner, & Brunnhuber, 2012).

➤ Description

The five steps of TRC can be seen on the diagram below.



Source: (Lietaer, Arnspenger, Goerner, & Brunnhuber, 2012).

1) TRC creation process

1a) Excess inventory sale. International firms affiliated to TRC may want to sell their production surplus. The Alliance can buy that excess of production from affiliate members. Wheat or barrels of crude oil are examples of products that can be affected by a surplus.

1b) Commodity valuation in TRC. Market prices determine the value of the sale of production surplus to the Alliance. A pre-determined procedure will then issue TRCs for the sale. This will happen for every good or service that enters the basket. The following formula is used:

$$[\text{Commodity value per unit} \times \text{number of units}] / \text{TRC Unit Value} = Y \text{ TRCs}$$

The following example is used by Bernard Lietaer to better understand this formula: “let us assume in our example that the commodity price for a barrel of oil at the time of the sale is 100\$. The commodity prices for each of the items in the TRC Basket at the time of the sale (i.e., copper, grains, lead, one unit of Carbon emissions rights, etc, including oil,) totals \$200. Let us further assume that one million barrels of oil are sold. Therefore, 500,000 TRC are created. [ $\$100 \text{ per barrel of crude oil} \times \text{one million barrels}$ ] /  $\$200 = 500,000 \text{ TRC} (\$200)$ ” (Lietaer, Arnsperger, Goerner, & Brunnhuber, 2012).

1c) Inventory balance. With every change, the portfolio of the Alliance will be recalculated to add the production surplus. Therefore, a TRC is always backed by the appropriate physical or future commodities, the value of which can change over time

1d) TRC creation. The seller of production surplus will see his account credited by the number of TRCs calculated in point 1b. (Lietaer, Arnsperger, Goerner, & Brunnhuber, 2012).

## 2) TRC circulation between users

Once it has been created, TRC can circulate between members for as long as they want. Different types of users exist. The company selling its production surplus is called the first user as they will put the money into circulation to pay a supplier or to acquire goods. The next users are the suppliers or sellers of goods to the first company. TRC will be circulating between them. Finally, the end user is the member who decides to exchange his TRC against a national currency (Lietaer, Arnsperger, Goerner, & Brunnhuber, 2012).

## 3) Demurrage

As mentioned in the characteristics of TRC, every TRC is affected by demurrage fee of 3.5% to 4% a year during the whole circulation cycle. This has two main objectives. First, it encourages members to keep TRC in circulation and second, it covers operation costs (Lietaer, Arnsperger, Goerner, & Brunnhuber, 2012).

#### 4) TRC cash-in

When the end user decides to cash-in, a 2% transaction fee is charged. This transaction fee also aims to encourage members to keep TRC in circulation and to cover conversion costs (Lietaer, Arnsperger, Goerner, & Brunnhuber, 2012).

#### 5) Reference currency

If this international currency shows its benefits and its resistance to inflation, it could become a reliable international standard of value. Non-members of the Alliance could still make a TRC contract and have the final transaction done in national currency (Lietaer, Arnsperger, Goerner, & Brunnhuber, 2012).

##### ➤ Probable impact of an international currency

An international currency such as TRC could have an impact on different layers of the economy. The world economy could be impacted by promoting long-term stability. The demurrage fee encourages users to think more in the long-term which is better for durability. Also, the nature of the basket counterbalances the normal economic cycle and creates a more stable environment.

Businesses would also be impacted because it allows them to rapidly convert illiquid assets. Also, as we mentioned before, TRC could be used as a reference currency in international contracts. Another possible positive outcome for businesses is that they do not need to hedge against fluctuation risks on the exchange market. TRC would therefore decrease transaction costs for businesses.

Finally, the banking sector could also be positively impacted. Like many complementary currencies, TRC is contra-cyclic. It would therefore stabilise the value of banking loan portfolios (Lietaer, Arnsperger, Goerner, & Brunnhuber, 2012).

### 3.1.8 Advantages

##### ➤ An ecological and economic action

Complementary currencies foster the purchase of locally-produced goods and services. The economic activity benefits the community because less is spent outside the community. It also gives a new dimension to professional activity and leads buyers toward a more “ethical” consumption thanks to a charter on ecological, social or human criteria signed by producers, merchants and organisations of the network (Mouvement citoyen pour l'instauration d'une

monnaie locale dans la ville de Québec, 2017). This local consumption also lowers transportation costs since more products are purchased and consumed close to the manufacturing location.

- A civic, social and democratic act

Complementary currencies make it possible for people to scale back the use of money. A grass-roots movement is launched when local money is created as many local people are implicated. This alternative currency allows to partially compensate for an eventual collapse of the financial system. Finally it also allows people to better connect with a community (Mouvement citoyen pour l'instauration d'une monnaie locale dans la ville de Québec, 2017).

- A short circuit at human scale

Complementary currencies usually circulate faster than national currencies. The same amount of money in circulation is used more often and induces a more important global economic activity. It also stimulates the local economy with a circular economy (Mouvement citoyen pour l'instauration d'une monnaie locale dans la ville de Québec, 2017).

- A creation and entrepreneurial power

Society only uses a small part of its resources and opportunities. Many people have underused knowledge, skills, and available time that could be used more efficiently. Complementary currencies are a creative way to unlock that potential (Mouvement citoyen pour l'instauration d'une monnaie locale dans la ville de Québec, 2017).

- Stabilisation of the economy

Complementary currencies can also stabilise the national economy. Many examples show that such currency allow the national economy to perform better, especially in time of downturn or depression. Activities related to the complementary currency will increase and will grow even faster than the activities subjected to the national currency. The national currency will no longer be the only tool for citizens to do business. The WIR system in Switzerland is the best example of this feature.

- Boosting the local economy

Local complementary currencies bring multiple benefits to the local economy. They 1) provide support to local businesses, 2) increase sales of local businesses through faster and local

circulation, 3) keep the created value inside the community, and 4) encourage a more ecological production and consumption (FMDV, 2014).

➤ Cooperative banks and local funding

In some complementary currency systems, a cooperative bank is established which offers attractive loans and funding to local SMEs and the population. This in turn improves local entrepreneurship and business development and makes access to finance for the population easier.

➤ Advantages of regional currencies for the public authorities

First, the profit produces additional taxable income which benefits the public sector. Second, due to initiatives, regional employment, can be maintained or even increased. Finally, improvements in the region through regional initiatives allow regional authorities to save on public expenditure (Kennedy, Lietaer, & Rogers, *People Money: The Promise of Regional Currencies*, 2012). Regional currencies also support the region and the restoration of the regional economy. They allow local SMEs to be granted local loans at a smaller cost through backup funds and mutual credit unions. The latter, based on the principle of solidarity, allows local companies to put their profits at the disposal of other local companies in the form of credit. They can also grant funding which is fully backed by assets or collateral (Kennedy, Lietaer, & Rogers, *People Money: The Promise of Regional Currencies*, 2012). Therefore, local public authorities should support and help implement these types of initiatives and systems to boost the economy in their region and tackle local problems.

### 3.1.9 Limitations

Even though complementary currencies have a lot of advantages and could help to stabilise the monetary system, they also have some shortcomings. A first limitation is the fact that some complementary currencies are backed by national currencies which result in a crisis if for whatever reason people massively start converting the complementary currency into national currency. If the whole system is not managed properly, the complementary currency might quickly become worthless. An example of careless management is the following: in March 2009, a complementary currency called HollanDollars became worthless. The company managing the program went bankrupt and the USD 108,000 that backed the currency disappeared. Therefore, the HollanDollars became completely worthless as they were no longer backed by anything (Fontinelle, 2017).

Another shortcoming of complementary currencies is that they are not accepted everywhere, even on the local level. Some businesses show no interest in a complementary currency and will therefore not become part of the system. This will ultimately reduce the choice for consumers who use complementary currencies. However, if consumers want to buy something specific from a business that does not participate in the program, they can always pay in national currency which will remain the main medium of exchange. Bookkeeping might become a bit more complicated for businesses who accept complementary currencies as they will have to register sales in different currencies. Business participation is not the only important factor. The system will not catch up unless consumers are willing to use complementary currencies, which is key (Fontinelle, 2017).

Finally, complementary currencies may act as a trade barrier. As we mentioned before, one of the objectives of a complementary currency is to promote trade inside a certain area. Goods in that area will be promoted over goods in another area. Therefore, promoted goods in the area become cheaper than goods from other areas. This leads to two phenomena: first, locals will buy more of those less expensive goods. Second, since goods from other areas become relatively more expensive, there will be less external trade. At a bigger scale, few communities using complementary currencies will enjoy some positive effects, but many communities doing so might forego the advantages of global trade (Ribar, 2009).

### 3.1.10 Conclusion

Complementary currencies represent a first possibility to get rid of the “monoculture” of the monetary system and its negative effects. Complementary currencies do not tend to replace national currencies but work alongside them and fill the gaps left by the traditional system. Therefore, they focus on the local economic development as well as social and environmental dimensions. The economic dimension tends to stabilise the system and boosts the local economy whereas the social and environmental dimensions tend to tackle current challenges such as climate change and harmony in communities, and in general to more sustainable behaviour. Complementary currencies are often launched to respond to the desire expressed by populations that desire something the actual system does not provide. Therefore, complementary currencies are in most cases bottom-up projects.

Complementary currencies can be commercial or community oriented. Different types of complementary currencies exist and they may have somewhat different goals ranging from increasing local business activities to making the region a better place to live in. We focused

on regional currencies where we gave examples of current and future complementary currencies. Those examples showed the following benefits: local economies boost, cooperative banks advantages, stabilisation of the economy, creation and entrepreneurial power, to name a few. Some drawbacks were also discussed such as possible limitations of global trade and the fact that complementary currencies can only exist if enough people or businesses join. However, the benefits of complementary currencies seem to outweigh the drawbacks.

### 3.2 Cryptocurrencies

We shall first define a cryptocurrency before discussing the mechanisms around these new digital or virtual currencies. *“A cryptocurrency is a digital or virtual currency that uses cryptography<sup>35</sup> to ensure the safe use of the currencies. A cryptocurrency is difficult to counterfeit because of this security feature. A defining feature of a cryptocurrency, and arguably its most endearing allure, is its organic nature; it is not issued by any central authority, rendering it theoretically immune to government interference or manipulation”* (Investopedia, 2017). This definition highlights two features of this new type of currency. First, this currency is based on cryptography, making it difficult to counterfeit. The information is encrypted and thus cannot be copied (Strickland, 2014). Second, a cryptocurrency is not issued by a central authority such as a central bank like traditional currencies, but is a decentralised digital currency transferred from peer-to-peer through the Internet. Another extremely important feature of cryptocurrencies such as the Bitcoin is that they are based on a technology called the blockchain. These features and their implication will be discussed further below in this chapter.

Bitcoin and Ethereum are the biggest platforms that issue their own cryptocurrencies, which are the Bitcoin and the Ethers, respectively (Jamali, Li, & Pantoja, 2017). The Bitcoin has currently outweighed the Ethers and for this reason the following parts of this chapter will only deal with Bitcoin which apply also to a large extent to the Ethers.

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<sup>35</sup> Definition: the computerized encoding and decoding of information; the process of writing or reading secret messages or codes (Merriam-Webster, 2017).

## 3.2.1 Bitcoin

### 3.2.1.1 Description

Bitcoin is currently the most popular cryptocurrency. It is the “first decentralised digital currency”. It was introduced in 2009 by one or more people only known by the nickname Satoshi Nakamoto (The Economist, 2013). As the term *decentralised* implies, Bitcoin is different from traditional currencies as it is not issued by any central authority but is created by users called “miners”. This makes Bitcoin free from any political system or government and therefore any decision made by them (Strickland, 2014). It is a peer-to-peer computer network where users “mine”, meaning they generate Bitcoins and monitor the system by solving complex mathematical problems and approving transactions (The Economist, 2013). These actions require extremely performant software and a lot of time. It is therefore not accessible to every user (Onies, Daniele, & Olayinka, Bitcoin overview, 2010). The absence of a central authority also plays an important role in the high volatility of Bitcoin as there is no central institution controlling it (Kewl, 2016). To illustrate this feature, the following graph shows the volatility of Bitcoin from its introduction to the present day. The second chart will expose the high fluctuation that occurs over a month.



**Source:** (Blockchain, 2017).



**Source:** (Blockchain, 2017).

Bitcoin is a digital token that can be exchanged for goods and services between parties through the Internet. It also possesses a certain market value as it can be exchanged on some platforms into main national currencies such as the euro (Scott, 2016). Bitcoin is basically a digital key formed by a dozen of characters which make it unique. This digital currency can only be exchanged through its network, which validates transactions between users and ensures its authenticity (Colombain & Sorel, 2014). Finally, a maximum amount of 21 million Bitcoins will be generated and new Bitcoins are created at a predictable and decreasing rate (Gray, 2017). Some people have forecasted that all Bitcoins will be mined by 2140 (Strickland, 2014).

### 3.2.1.2 Is Bitcoin Really a Currency?

Before discussing the technological aspect of Bitcoin, it is relevant to analyse cryptocurrencies by analysing whether Bitcoin, as a cryptocurrency, meets the traditional functions of money.

Bitcoin meets the first function which is “medium of exchange”. People can buy and sell goods and service with Bitcoins through the Internet. Even though it is still limited, Bitpay, which owns 50% of the market shares of Bitcoin, recorded 100,000 transactions in 2015 (Jamali, Li, & Pantoja, 2017).

However, Bitcoin does not meet the second function of money which is “store of value” for several reasons. First, since Bitcoin highly fluctuates, it is a risky way to save wealth as the value can heavily decrease over time. Also, Bitcoins cannot be deposited in banks and are kept in digital wallets which are costly to maintain and subjected to hackers (Jamali, Li, & Pantoja, 2017).

Again, because it is so volatile, Bitcoin does not meet the last function of money which is “unit of account”. It is extremely difficult to determine the price and value of a Bitcoin since they fluctuate so much (compared to traditional currencies) (Jamali, Li, & Pantoja, 2017).

After this analysis, we can conclude that Bitcoin and cryptocurrencies in general do not meet the traditional functions of money. It is therefore important for people to be aware of this fact and the fact that Bitcoin shows a major risk due to its high volatility. For these reasons, Bitcoin remains nowadays a highly speculated financial instrument and its functionality is limited.

### 3.2.1.3 The Blockchain Technology

#### 3.2.1.3.1 Description

The technology on which the Bitcoin system is based is called the blockchain. As the name suggests, it is a chain of blocks that record the encrypted information of all transactions of the system. Each block of the chain is connected to the previous block by referencing it in its information, which is coded (The Economist, 2013). The blockchain can be represented as “a decentralised public ledger, collectively maintained by a network of participants” (Scott, 2016). This digital file contains the balances of all participants and users, who exchange money by updating this ledger. The numbers which represent the cryptocurrencies are not backed by gold or money (CuriousInventor, 2014). The fact that this ledger is open to everyone in the chain makes it extremely complex for hackers, as each block is confirmed by multiple users called miners. Changing a block would then involve changing the memory of every user who has validated the block information as well as altering all the following blocks. This makes the blockchain immutable and secure (Jamali, Li, & Pantoja, 2017).

As previously mentioned, the blocks contain coded information about transactions. When enough information has been gathered, a block is created and is connected to the rest of the blocks in the blockchain. To connect it, users with enough computational power solve complex mathematical problems in the form of combinations guesses. This connects the blocks. These users who can resolve these mathematical problems are called “miners” (Jamali, Li, & Pantoja, 2017). When a miner finds a solution first, he reveals it to the rest of the network who validates it and adds it to the chain (Onies, Daniele, & Olayinka, Bitcoin Technology, 2010). The confirmation of a transaction only happens when the transaction is packed in a “block” which follows strict cryptographic rules. It will then be verified by the network. This method ensures that previous blocks cannot be modified which means that no one can control or modify what

is in the blockchain. There are many advantages to the mining process. It creates a chronological order in the blockchain, enforces network neutrality, and enables various computers to agree on the system's state (Bitcoin Project, 2017).

“Blockchain 2.0” is used to describe a decentralised public ledger that records items or transactions not related to currency transactions. Many start-ups are indeed experimenting it. For example, a blockchain could be introduced to record property rights in countries with weak record-keeping systems (Scott, 2016).

#### 3.2.1.3.2 Mechanism

As mentioned previously, all transactions are recorded on a public ledger. This means that every user owns a copy of the ledger and can add a line – a transaction – on their ledger. However, a transaction can only be valid if the counterparty approves it by signing it digitally.

Concretely, a digital signature is created with a private key and a public key pair. The signature is unique for each transaction. If the transaction's message is altered, the signature will be completely different. The signature is basically a function depending on the transaction's message and the private key. The private key is secret and ensures that the holder is the only one who can produce the signature. This makes the digital signature impossible to guess if the private key is not known. A signature can therefore not be copied as it is unique for each transaction. Also, to prevent users from performing the same transaction multiple times, the message has to include a sort of unique ID associated with that transaction, which means that the exact same transaction requires a completely new signature. Also, the signature is validated by another function which depends on the message, the signature and the public key. It ensures that the signature was produced by the private key associated to the public key. Finally, to make sure users pay their debt, they can only spend what they have on their ledger. This means that a transaction will be invalid if the user does not have sufficient funds (Sanderson, 2017).

Because every member has a copy of the ledger, when a participant adds a line, he has to broadcast his ledger to the other members so that they can modify their own private ledgers. The issue is participants have limited trust in transactions from people they do not know, and are afraid of fraud. This problem is addressed by the cryptographic hash function. This connects trust and computational work, meaning that it would require an inordinate amount of computation to create a fraudulent transaction and conflicting ledgers (Sanderson, 2017).

Concretely, the input of that cryptographic hash function can be any sort of message. The output is a string with a fixed length of 256 bits which is called the hash of the message. The smallest change in the input will affect the output in a completely unpredictable way. The cryptographic hash function also makes it impossible to compute in reverse. The function input cannot be discovered with the output. It is only possible through numerous guesses and is correct when it starts with a specific number of zeros. Making so many guesses is only possible if a miner has massive computational power. For example, to find an outcome that has to start with 30 zeros, around one billion guesses are required. When a miner discovers the right outcome, he broadcasts it to the network who can easily verify it by running the hash function. When an outcome is verified, it gets attributed a “proof of work” (Sanderson, 2017).

As previously mentioned, transactions are divided into blocks. These blocks consist of a list of transactions together with a proof of work in the form of a special number. A block can only be validated with a proof of work. Each connected block contains the hash of the previous block as its header. Changing one block would require changing all previous blocks, which renders modifications in the blockchain impossible (Sanderson, 2017).

Miners play multiple roles. They have to collect the different transactions, put them together into blocks and find the special number that makes the hash of that block start with a series of zeros. When a miner finds the outcome, he broadcasts the block. As a reward for creating the block, a very special transaction is written at the top of it and is called the block reward. Since it does not come from a person, it needs no digital signature. The block reward is the cryptocurrency of the system. This means that the total amount of the cryptocurrencies in the system increases with each block creation as it is the only tool that creates the cryptocurrency (Sanderson, 2017).

The main task of the participants is to listen for miner broadcasting blocks and update their own personal copies of the blockchain. If two or more distinct blockchains (different transaction histories) are broadcasted, people refer to the longest one which is the one with the most work on it. The trust thus comes from the blockchain with the most computational work. As insurance, users wait for several blocks before accepting them to be sure it is the right sequence (Sanderson, 2017).

### 3.2.1.4 Bitcoin System

#### 3.2.1.4.1 Collecting Bitcoins

Before we can describe the transaction process, we must first understand how to obtain Bitcoins. There are three different ways to get Bitcoins: 1) accepting Bitcoins as a medium of payment for goods and services, 2) exchanging them with a more traditional form of currency such as euro or dollar, and 3) mining them. When a miner first solves the complex mathematical problem and thus connects the block to the blockchain, he is rewarded with Bitcoins (Strickland, 2014). Early on, the reward was 50 Bitcoins. However, after every 210,000 blocks, roughly every four years, the reward is cut in half. This means that the current reward is 12.5 Bitcoins per block. This decreasing number explains the limit amount of 21 million Bitcoins since blocks creation is the only way to create Bitcoins. A new block is created about every ten minutes (Sanderson, 2017).

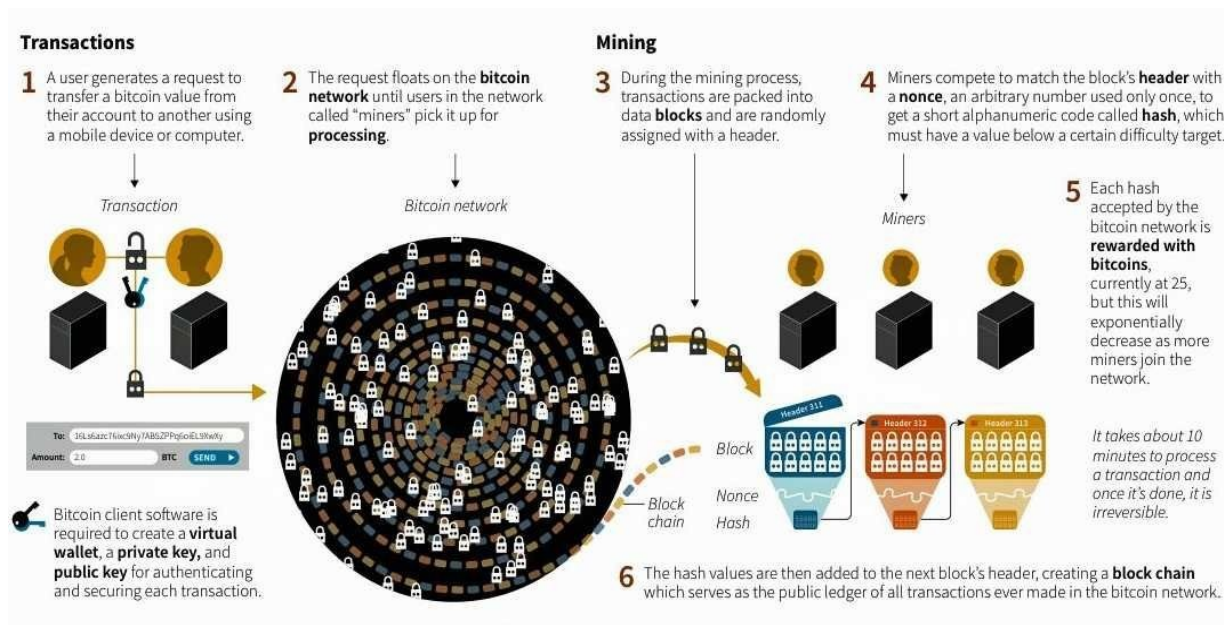
#### 3.2.1.4.2 Transaction

A transaction between Bitcoin users can be represented by a transfer of value between Bitcoin wallets that are incorporated in the blockchain. Each Bitcoin wallet has a secret piece of data called private key that is used to sign transactions through a mathematical mechanism that proves ownership. This signature cannot be altered or used by anyone else (Bitcoin Project, 2017). The private key is anonymous and not attached to a user's personal information. A user can only be tracked through his transaction history, which is public. Besides the private key, users also have a public key. People get assigned Bitcoins based on their public key address (Onies, Daniele, & Olayinka, Bitcoin Technology, 2010).

So when Person A wants to transfer a Bitcoin to Person B, Person A will change the public address linked to one of their Bitcoin with that of Person B (Scott, 2016). Person A then signs the transaction with their own private key. After that, the transaction is broadcasted to the network where miners validate the signature and amount before sending it back and adding it to the block. To ensure that transactions are not made twice, the network assigns sequential identifiers to each transaction which prevents later modifications. The transaction is only confirmed when it is admitted in the blockchain (Onies, Daniele, & Olayinka, Bitcoin Technology, 2010). Finally, when people make payments, they can include an optional small transaction fee which will be given to the miner for the block creation that includes the

transaction. This creates an incentive for miners to include the broadcasted transaction in the next block. Each block in the Bitcoin system is limited to 2,400 transactions (Sanderson, 2017).

### Recap of the Bitcoin System:



Source: (Gray, 2017).

### 3.2.2 Advantages

Cryptocurrencies and especially Bitcoin show several advantages compared to the traditional financial system.

First, thanks to the blockchain technology, the transactions are not subjected to any central intermediary. This means that transactions are made within minutes and do not require to be accepted by any bank (Kewl, 2016). There are also no banking charges or exchange rates involved in international transactions (The Economist, 2013). Fees and costs associated with the transactions cannot be charged without approval of the parties involved, making it more transparent and less complicated than traditional financial institutions (Kewl, 2016). This simplifies international transactions and allows people who would not meet the criteria of traditional banking system to access low-cost remittances and finance (Scott, 2016). However, it is important to mention that there are maintenance fees because the digital wallets where Bitcoins are stored are costly (Jamali, Li, & Pantoja, 2017).

Second, as there is no central authority, nobody controls the cryptocurrencies. Governments on judgescannot freeze accounts like they could do in traditional currencies (Onies, Daniele, &

Olayinka, Bitcoin Advantages, 2010). There is also no implemented regulation or tax system. It also gives people a chance to access a decentralised global bank where users only need to download an open source wallet instead of being tied to a traditional financial institution. This could improve daily transactions and offer a safer way to store money in countries with a poor banking infrastructure. However, these advantages would only concern a Bitcoin with a more stable perceived value. This is not yet the case because of its high fluctuations and its reputation (Scott, 2016).

Third, since private keys are confidential, the user is kept anonymous in his transactions which are made public and maintained by the miners in the blockchain. The file cannot be manipulated without the community finding out, rendering fraud almost impossible (Kewl, 2016). Bitcoins cannot be stolen unless someone takes physical possession of a user's computer and commits an identity fraud (Onies, Daniele, & Olayinka, Bitcoin Advantages, 2010).

Finally, Bitcoin as a cryptocurrency is very divisible. The smallest denomination of Bitcoin is called a "Satoshi" which represents one-hundred-millionth of a Bitcoin. This facilitates transactions as well (Kewl, 2016).

### 3.2.3 Disadvantages

The qualifications used above when discussing the advantages suggest that there are multiple disadvantages to Bitcoin and cryptocurrencies in general.

The biggest issue around Bitcoin is its high volatility. As we mentioned, many benefits would come from a more stable Bitcoin. Its high volatility is due in part to the absence of a central authority (Strickland, 2014). This absence also makes it impossible to offer users value guarantee since no authority has the power to guarantee a minimum value. The stability of the system also depends on the number of participants. Unfortunately, this high volatility can make people leave the system, which makes fluctuations increase even further. If more people were to enter and use the system, it would stabilise. The more participants, the less impact a single participant has on the price (Scott, 2016). This high fluctuation is also linked to the limited number of Bitcoins. The value of Bitcoins tends to increase as the maximum amount approaches. The unpredictable and fast fluctuation makes people unsure of when to spend their Bitcoins, making it even more unpredictable (Onies, Daniele, & Olayinka, Bitcoin Disadvantages, 2010).

Another issue of Bitcoin is its anonymity and the reputational risks attached to the use of Bitcoins. Bitcoin is an attractive currency for money laundering or illegal activities because of its complex and opaque system (The Economist, 2013). In this sense, the European Union is trying to obtain the ability to identify users in order to fight criminal activities such as terrorism (Gray, 2017). This anonymity also makes tracking down the counterparty extremely difficult if something goes wrong with the trade (Kewl, 2016). If a seller does not deliver the goods or service, there is no buyer protection because the blockchain technology makes the transaction irreversible. However, it is possible to hire an intermediary to ensure the transaction. By using banking intermediaries, Bitcoin would become more like traditional currencies (Onies, Daniele, & Olayinka, Bitcoin Disadvantages, 2010).

Third, like any other software, the Bitcoin system is vulnerable to hackers. If a user's computer is attacked by a virus which corrupts their Bitcoin wallet, the Bitcoins are lost and there is no way to get them back. People could lose a fortune in seconds (Onies, Daniele, & Olayinka, Bitcoin Disadvantages, 2010). However, traditional banks can also be hacked, or simply robbed. The Bitcoin system has matured and evolved and security standards have improved (Scott, 2016).

Fourth, changing the system is rather complicated since it requires the cooperation of almost every participant. Therefore, solving recurrent problems, offering solutions and restructuring the system is complex. Also, a limited amount of transactions is allowed for a specific timeframe, which decreases transaction speed (Gray, 2017).

Fifth, there is no common consensus among countries regarding this technology. Some countries treat it as a currency, others as a commodity and others forbid it entirely (Gray, 2017). This difference of treatment makes it all the more complicated to use worldwide.

Bitcoins can only survive in countries that have sufficient access to technology. A proper Internet connection and a computer or a smartphone are required to interact with the system (Scott, 2016).

Finally, many sources such as The Economist and some people working closely with Bitcoin believe that Bitcoin will fail. However, other studies expect that Bitcoin and other cryptocurrencies will last (Gray, 2017). The future of this disruptive technology is therefore unclear.

### 3.2.4 Comparison with the Banking System

As mentioned hereabove, the Bitcoin system and its related blockchain technology show multiple divergences from the traditional banking system. For one, the blockchain technology eliminates the need for banks in transactions.

The database which records payments and transactions is a decentralised, public network in the Bitcoin system. Miners are responsible for system maintenance and database modifications. On the contrary, the database in the banking system is privately held and managed by the bank itself (Scott, 2016). The blockchain technology allows people to exchange wealth through Bitcoins without using any intermediary such as banks. The two systems and their transactions are totally different.

### 3.2.5 Conclusion

As we exposed earlier, the blockchain technology is a disruptive technology in the financial world in the sense that people make (international) transactions without using traditional financial institutions. Introducing an apolitical cryptocurrency technology could help reduce interference by governments and/or central banks and thus help create a neutral free market (Scott, 2016).

The blockchain technology has made the Bitcoin system possible but it has already inspired this technology other alternative systems such as the Faircoin project. This global cryptocurrency is at the basis of a global cooperative network. The project which is still in its early stages uses cryptocurrency technology to move from a capitalist to a more collaborative and cooperative world by creating alternative systems (Scott, 2016). This project and concept will be discussed hereinafter.

However, it is important to stress out that cryptocurrencies show multiple issues related to their technology and high volatility which will have to be fixed to become a viable and sustainable financial system. Nowadays, cryptocurrencies are mainly linked to non mainstreams payments.

In the next part of this chapter, we will analyse if it the advantages of the blockchain technology can be combined with the concept of complementary currencies since local currencies seem to have an important stabilising and sustainable role in the economic system.

### **3.3 Complementary Currencies Based on the Blockchain Technology**

The concept of complementary currencies supported by the blockchain technology was first introduced to us as by Professor Diniz, a Brazilian economist we had the chance to interview in person in Brazil. According to him, an important factor in the implementation of complementary currencies is through their digitisation. Digital complementary currencies offer multiple advantages that can boost their expansion and growth. The main objective is to reduce the costly and cumbersome management of complementary paper currencies.

#### **3.3.1 Description**

The introduction of the blockchain technology in the implementation of complementary currencies could make the system more efficient, more reliable and cheaper. They would be cheaper since managing them would require only a few people and no central authority. The efficiency of the blockchain would also remove the need for intermediaries and transactions would be much faster. In this sense, the complementary currency systems will adopt decentralised platforms. At this point, a few complementary currencies based on the blockchain have been implemented but there are still in their early stages. Most of them have only been around for a few months. Therefore, it is too early to give an opinion on their viability. Nevertheless, the concept shows strong potential (Diniz, 2017).

Digital decentralised platforms could also enhance the collaboration and exchange of complementary currencies between them through partnerships. A complementary currency from a specific community in a given country could be exchanged with another currency from another community in another country. This would prove that complementary currencies do not hinder globalisation since it would be possible to use one complementary currency to buy goods and services from a foreign community by exchanging it into the local currency. This option does not currently exist (Diniz, 2017).

#### **3.3.2 Initiatives**

##### **3.3.2.1 D-Cent**

D-Cent is a project introduced in 2013 supported by the European Commission with the aim of “developing large-scale collective platforms to support citizen empowerment” (Roio, Sachy, Lucarelli, Lietaer, & Bria, 2015). The project offers multiple tools such as collaborative policy making, electronic voting, blockchain reward and trust scheme (D-Cent, 2016). This last tool

called Freecoin is an “open-source approach to decentralised complementary currency design” (Roio, Sachy, Lucarelli, Lietaer, & Bria, 2015). Freecoin is a free and open source toolkit that enables people to implement reward, remuneration and incentive schemes which are completely transparent, based on the blockchain technology and use digital currencies or vouchers (D-Cent, 2016). It rewards communities for implementing their own complementary currencies supported by the blockchain technology. This concept was inspired by the first complementary cryptocurrency, the HullCoin.

### 3.3.2.2 HullCoin

#### ➤ Description

HullCoin is the first digital complementary currency based on the blockchain technology. It has the same technology as Bitcoin but has a completely different purpose. With a social object in mind it was set up in Hull city, United Kingdom to reward volunteers and was developed in such way that currency speculation would not be possible (Walsh, 2016).

Lisa Bovill and Dave Shepherdson, the founders of Hull Coin, decided to create a complementary currency in Hull that would address the problems caused by austerity measures which increased unemployment and cut essential services. They thus invented the HullCoin to tackle these problems and offer a new way of payment (Walsh, 2016).

HullCoin is not created by bank debt like conventional currency but is a reward for fulfilling social needs. It cannot be acquired by exchanging national currency. HullCoin aims at “linking value creation to social credit” (Walsh, 2016). Moreover, social actions are recorded in the system and can be shared to create a volunteer profile, which could be an interesting statement on the job market. The HullCoin is therefore created through the completion of proposed actions such as volunteering and community service (The Fintech Times, 2017).

#### ➤ Mechanism

The HullCoin has no intrinsic value and is connected to the blockchain. It is basically an indicator that confirms the blockchain that the service has been done and that the payment can be released upon proof of work. This blockchain-based complementary currency offers multiple advantages such as elimination of fraud, transparency on funds' location and efficient payment infrastructure ensuring global and secure exchanges (The Fintech Times, 2017).

In practice, people create a HullCoin wallet and then search for activities on the website to earn HullCoins. After the search, people get approval from the system for completing them. As a

reward, people receive HullCoin for their work and can spend them in local shops (HullCoin, 2016). Soon, HullCoin may also be used to pay local taxes or rent.

➤ Impact

As it is still in its early stage, it is not yet possible to analyse the impact of HullCoin on the local economy nor the potential of such currency to deal with the limitations of the national currency in the coming years. The HullCoin's success will mainly depend on the acceptance and support of the public authority as well as the willingness of citizens and local firms to adopt and use it. In any case, the concept behind this initiative is revolutionary and is the basis for the new generation of complementary currencies based on the blockchain technology.

### 3.3.2.3 FairCoin

➤ Description

FairCoin is a cryptocurrency that is issued by a cooperative named FairCoop. The main technical feature of the FairCoin is that it is mined differently: "Proof-of-Cooperation is the unique consensus algorithm developed for FairCoin. In contrast to other cryptocurrencies and starting on July 18th, 2017, FairCoin does not use any mining or minting functionality any more, which are both competitive systems. Block generation is instead performed by so-called certified validation nodes that cooperate to secure the FairCoin blockchain" (FairCoin, 2017).

➤ Mechanism

Certified validation nodes (CVNs) play a major role in the proof-of-cooperation algorithm. The CVN that creates the next block will be determined based on the consensus rules. All other CVNs approve of the chosen CVN that creates the new block by signing a piece of data that contains its unique ID. Once all the CVNs have signed that piece of data, the chosen CVN will create a new block that will be added to the chain. It should be noted that this is a very young technological innovation.

Another difference between Bitcoin and FairCoin is that FairCoin becomes a redistribution of social value based on social cooperation through FairCoop. The goal of FairCoin is to use cryptocurrencies, not simply as money but as a tool of innovation at the service of fair and sustainable projects in economic, political and social-cultural fields. FairCoin is used by companies, associations and cooperatives who want to share resources and ideas in one network and use a common currency (France24, 2015).

### 3.3.3 Conclusion

Using the blockchain technology for supporting complementary currency systems is interesting for multiple reasons. It offers a better, easier and less expensive management. It also decentralises the system and makes it more transparent. The HullCoin, as a complementary cryptocurrency, also shows that it is feasible to use the blockchain technology and avoiding that the currency can be used for speculation and thus get rid of one of the main drawbacks of the Bitcoin and cryptocurrencies. Moreover, this concept matches the vision of Professor Diniz who sees the digitalisation of complementary currencies as a crucial condition for their rapid growth and expansion.

The examples above confirm the trend that complementary currencies supported by the blockchain technology are technically feasible. However, the various implementations are still in their early stages and thus their viability in the long term cannot yet be assessed.

Finally, we would like to point out D-Cent, the relevant project introduced by the European Commission that promotes the concept of complementary currencies and helps communities adopting them. This is a proof that public authorities start to realise the benefits of such tools.

### 3.4 Perspectives

The main structural issue in the current monetary system is its “monoculture” which might jeopardise the whole economy if trust in the dominant currency is lost. Like Professor Bruno Colmant suggests, money can only survive as long as it gathers enough believers around it as the value of money depends mainly on the trust people place in it (Colmant, *La monnaie et Jésus-Christ*, 2016). Therefore, it is important to make the current monetary system more sustainable and stable. Complementary currencies do not pretend to replace the current monetary system but could bring the necessary structural change that would allow it to become more stable and sustainable.

We believe that complementary currencies will continue to grow as they offer solutions to the limitations of the national currencies. Moreover, the awareness of the existence of complementary currencies is increasing too which is positive as more and more people will try them out and spread the word. Finally, successful complementary currencies such as the Banco Palmas continue their efforts to help the communities. This increases the number of banks and spreads the idea in other regions and countries. Once again this positively affects awareness of people leading to more complementary currencies and new ideas that will fill certain needs.

As mentioned by Professor Diniz, the technology behind cryptocurrencies could strongly help complementary currencies grow and improve their infrastructure. The blockchain technology could make managing complementary currencies easier and reduce their related costs. Projects with complementary cryptocurrencies have already been launched but they are still in their early stages.

Correspondent banking is an interesting concept that is common in many countries such as Brazil. This method allows retail stores to provide banking services in the name of a bank. For example, post offices in Brazil are connected to the traditional financial institution Banco do Brazil. This concept is broader in Brazil and also applies to community banks. For example, Caixa Economica, another traditional Brazilian bank is connected to multiple community banks which can provide banking services in the name of that bank. It can be seen as a partnership between a community bank and a traditional bank which allows it to offer services that communities do not usually offer such as insurances and savings (Diniz, 2017). This type of partnership could highly increase the integration of complementary currency systems in the current economic system by involving traditional players. It could also benefit these traditional economic agents by offering them new profitable activities. At this stage, this vision is not yet implemented in the European financial institutions as they do not recognize the benefits of this partnership and try to keep a distance from complementary currencies (Legrand, 2017).

This makes us believe that the next generation of complementary currencies is ready and that these currencies will play a major and crucial role in stabilising and humanising our current monetary and economic system. Our conviction is supported by the D-Cent project implemented by the European Commission which shows their implication and belief in such a vision.

## Chapter 4: Field Research of Complementary Currencies in Belgium

In the previous chapter, we introduced complementary currencies. The main benefits have been enumerated and different projects have been discussed. As Belgian students, we wanted to explore the two Belgian projects more in depth. Therefore, we planned interviews with representatives from the Toreke project in Ghent and the RES system in Leuven. Moreover, both projects have different goals which make them a balanced choice. The Toreke is driven by social goals whereas the RES relies mainly on economic objectives.

These meetings gave us a deeper insight on the ideas and the people behind both projects, along with their plan for the future. It allowed us to understand their motivation behind their initiatives and their convictions. We also took this opportunity to hear from them about the impact of complementary currencies on the current economic and monetary system. We identified different items of concern in each project and we tried to offer solutions based on our theoretical research.

We strongly believe that what we learned from our field research helped us to understand the vast and still unlocked potential of complementary currencies and offered an additional dimension to our research.

We had interviews with Anissa from the Toreke project and Junior for the RES project. These interviews have enabled us to get a good inside view on these projects that we explained already hereinabove from a more theoretical point of view. In our field research report we start with a further description of the project, including the motivations behind the project. After that, we will describe the main positive impacts. We will finally address the limitations as well as potential improvements we have proposed. We will start with Toreke and then the RES project.

### 4.1 The Toreke Project

Rabot is a very low-income area in the city of Ghent, where drug problems and criminality are omnipresent. It was even named the poorest area of Flanders in 2015. This area is also home to many people of different origins. The major issue in the area is that the people are very poor and did not feel integrated in society. Most people have a lot of free time but little money. As most of them do not speak Dutch, they face difficulties finding a job. Society tends to have a negative image of them and sees them as people not worth investing in. Despite having skills in other domains such as agriculture or construction, their talent is not recognised by society.

Recognising this problem, an alderman of the city, Freya Van den Bossche, launched the Toreke project in 2010. In cooperation with several economists such as Bernard Lietaer, they developed the currency Toreke and the whole economic and monetary system that goes with it. The Toreke can only be used in Rabot. The Toreke project is a collaboration project between the city of Ghent, which subsidises the project and the association and the inhabitants of Rabot. Since the currency is dedicated to the area, the inhabitants have their word to say, they are part of the decision process. It is extremely important to stress out that this social project is not financially autonomous. The Torekes that are cashed by the participating shopholders and businesses in the Rabot neighbourhood can only be exchanged into euros thanks to the budget allocated to the association by the city of Ghent. This relationship between the public city authority and the association enlightens the connection between the competitive economy and the cooperative economy which is supported through subsidies.

The project rests on three pillars: 1) neighbourhood care, 2) neighbour care, and 3) environmental care. Through neighbourhood care, the Toreke project tries to embellish the area and make it more liveable. Several activities are planned, for instance cleaning the streets or repainting facades. Neighbour care develops services between inhabitants such as helping elderly people with groceries, babysitting, or homework assistance. Finally, environmental care establishes new and durable habits inside the area like collecting rainwater or sustainable agriculture.

The only way for the inhabitant to earn Torekes is by accomplishing tasks that are part of one of these three pillars. To be paid in Torekes, they first need to register with the organisation. The organisation will then perform a background check and fill in the necessary paperwork to allow an inhabitant to become a volunteer and will determine how many hours the new member is allowed to work. For each hour of work, volunteers are paid 25 Torekes. Knowing that 10 Torekes equals 1 euro, one hour of work corresponds to 2.50 euro. However, during the interview, Anissa stressed out the fact that there is a thin line between volunteer work and “cheap labor” which they absolutely do not want. Therefore, people only come if they want to work within the three pillars and feel good enough to do so. Even when they work, they can leave at any time or take a break if they are tired. They do not have to perform a minimum number of hours. The Toreke project has given another sense to the word working.

Torekes can then be spent in participating local shops that are listed on the Toreke project website. Business owners also have a special sign hanging at the entrance of the shop to let

people know they are part of the project. Moreover, individuals can exchange Torekes among themselves for services that fall within the tree pillars, go to the association to buy movie tickets or transport tickets and even go to one of the two social restaurants in the area. Converting Torekes into euros is strictly prohibited, since this would make the complementary currency lose all meaning. Only participating merchants can convert Torekes into euros. These euros come from the subsidies allocated to the association by the city of Ghent.

#### 4.1.1 Positive Points/Impacts

- The main positive impact of the Toreke project is that participants feel like they are an important part of the community. Instead of being home all day, they are active citizens helping the community grow. They receive responsibilities from the association and they want to show they deserve their trust.
- Another positive impact is that they develop a social network. By going outside and taking part in different activities proposed by the association, they learn to know each other and develop new friendships.
- Furthermore, by being busy instead of doing nothing, criminality has decreased in the area. Kids are more respectful at school or during football lessons, and others may be less likely to get back in the vicious circle of criminality.
- Merchants also feel the positive impact of the Toreke project. Since people who had no money are now able to pay in Torekes, their sales have increased in the area. This gives them the opportunity to develop their shops.
- Last but not least, the three pillars have really improved the neighbourhood. By cleaning the streets, repainting facades, developing social links and being more durable, the area has become much more liveable.

#### 4.1.2 Possible Improvements

- The cycle between earning Torekes and converting it into euros is currently too short. In most cases, when the Torekes are earned by individuals, they are mostly spent in local shops. The merchants will then convert their Torekes in euro, ending the cycle. To avoid that, we proposed two possible solutions to Anissa. A first way is by imposing a conversion tax to “force” merchants to keep the Torekes in circulation. This is not the preferred idea of the organisation as they feel it might reduce the number of participating local merchants and might change the status of the organisation as they will earn money

that way. They also want to discuss this possibility with the participants of the project as they are the centre of it. Another possible solution is to offer more services to merchants such as paying someone in Torekes to clean the shop or the windows or to help with unloading the trucks. This would give more possibilities for merchants to keep the money into circulation. They considered it as a really interesting improvement.

- Even though the project has been launched in 2010, only 1/27 of the inhabitants is currently participating. Out of 9,476 inhabitants, only 350 people are participating, which is not enough. By increasing the number of users, the area could really develop further. It would also likely have a positive effect on the number of shop owners participating and develop the local economy. The current marketing plan consists in displaying posters, talking to people and organising meetings. We believe that other tools can be used such as the Internet and social media. More and more people have smartphone (even if that is less the case in poor neighbourhood) and this is an easy way to increase awareness.
- Another possible improvement concerns the security of the paper money that is used. Even though it is printed by a professional, the only securities are a serial number and a special mark on the paper. Other security measures could be taken such as with the euro bills. According to the association, it is safe enough since locals do not have enough money to make counterfeits. However, we believe it is not that complicated. We also mentioned the idea of a digital currency, they told us they had already introduced one but people did not use it as they preferred to have money in their hands. Moreover, people in the area have a limited access to smartphones. As the development and maintenance of the digital currency system is really expensive to the association, they will soon abandon it.

#### 4.1.3 Conclusion

The information we received from Anissa gave us a more precise idea of how a social complementary currency works. At the end of the interview, she showed us the neighbourhood and all the different activities such as the gardens where they grow food, the football area, the local bike repair shop and the small farm they developed. The different pictures can be found in appendix A.4.2. We were able to see the positive impact it had on the area and on the people who participate in the Toreke project (Boutiebi, 2017).

## 4.2 The RES Project

The interview has allowed us to find out more about the motivation behind the introduction of this project and its evolution. We have also addressed certain specific themes such as how to set up and develop complementary currencies, the economic potential of the RES system and the compatibility with the blockchain technology as well as ways to improve the current monetary and economic system. The opinions from Junior on these matters were extremely constructive and interesting.

The RES project was introduced in 1996 based on the desire to create a network of local businesses (multinationals are excluded) to increase collaboration between them and offers multiple advantages. Even though it was inspired by the WIR system, it is slightly different now. The developers of the RES authority have allowed individual consumers to enter the network which was previously for local businesses only. Junior explained that the strategy behind this is to open the network to additional people, therefore increasing the notoriety of the system. Individuals can now obtain prepaid cards (see appendix A.5.2.) which can be topped up with RES through an online payment. With this prepaid card, consumers can buy goods and services from RES businesses. A strategy to increase the use of this prepaid card lies in a financial advantage. After each top up, consumers receive an additional 50% RES on their prepaid card. The main income for the RES authority comes from the transaction fee of 3.5% per transaction. This income enables the authority to hire employees who offer multiple advantages to the RES businesses like promotion and awareness.

An important feature of the RES system is that RES currencies never leave the network. They remain inside due to the fact that neither businesses nor individuals can exchange RES back into euros. One RES has the same value as one euro.

According to Junior, the complementary currencies are still in what he referred to an “early adopters phase”. This means that these currencies are not yet well known by the majority of the people and that an increase in awareness is essential for the development of the concept. In this sense, we asked him whether the RES might be based on the blockchain technology in the future and if this possibility had already been considered. He answered that this eventuality had already been mentioned but not yet analysed.

#### 4.2.1 Positive Points/Impacts

- The main feature of the RES system is that, contrary to the Toreke project, it is financially autonomous. The income perceived by the RES organisation enables it to support the entire system. Therefore, it does not need any financial support from a public authority and is not subjected to it.
- The RES system implements several tools for businesses to keep their RES revenue level between 3% and 5%. This is important as RES cannot be exchanged into euros and businesses have costs like taxes to pay in euros. In this sense, businesses can specify the percentage and maximum amount of RES they will accept.
- The RES organisation is able to grant credits to businesses which can take several forms. First, their accounts can go in the negative, up to -2,000 RES. Another option is to grant an RES credit to the business with the promise that the business will see through the system goods and services worth the same amount by a certain date. This credit is not subjected to interest rates. This tool offers a faster credit line than the traditional banking system.
- The system allows to keep money locally which in this case means Belgium. Money will not leave the country. Therefore, taxes will be paid in Belgium which creates an advantage for the local public finances.
- The RES system shows a positive economic impact for local businesses. It also boosts local production and consumption.

#### 4.2.2 Possible Improvements

- The RES system is still too small to have a real impact on the global economy in Belgium. As an illustration, the 50 million RES worth transactions are extremely small compared to the global Belgian economy. It is still too early for the RES to show the stabilising role that the WIR shows in Switzerland.

#### 4.2.3 Conclusion

The RES system is a good example of a complementary currency with a commercial-oriented purpose. The analysis of this system has shown multiple economic benefits resulting from the implementation of such currency. Even though the network is still too small, it shows potential to acquire a stabilising role for the global economic system in Belgium like the WIR in Switzerland.

### 4.3 Assessments

The goal of both interviews was to confront the theoretical aspects that were developed in chapter 3 with what is happening on the field. A first confirmation is that community-oriented currencies do indeed exist including in Belgium. The Toreke is a small scale but successful example of such a currency. It has been developed in the Rabot area and strives to develop and improve social interactions and well-being inside the neighbourhood. This is done through three pillars which are neighbour care, neighbourhood care and environmental care.

As we mentioned multiple times in chapter 3, complementary currencies do not have the goal to replace the actual monetary system but to work in parallel with it. This is proven by the fact that the competitive economy and the cooperative economy are still linked, such as the Toreke association receiving subsidies in euros from the city of Ghent. By working in parallel, the Toreke project and the city of Ghent have been able to tackle problems that are absolutely not in the scope of traditional mono-cultural system. The project enabled to reconnect people that had been left behind by society as they were considered as “not fit to work and thus not “worth investing in”. The first conclusion is that the competitive market is still very important for community-oriented currencies. As the Toreke project is not financially autonomous, the competitive economy is essential for its survival. This funding enables community-oriented currencies to focus all their attention on social objectives and on improving neighbourhoods and helping underprivileged citizens. These currencies also tackle specific problems in the society that could not be addressed.

The RES is characterised by a business development objective. It aims to boost the local economy by acting as a support for local businesses through multiple tools such as increasing the number of customers, keeping the money circulating in the community and granting credits. This is also beneficial for the public sector finance of the country as money is kept locally inside the network. This means that the money does not leave the country which increases tax revenues.

Finally, based on our interview with Junior Smets, we think we need to scale down somewhat our expectations regarding the stabilising role of complementary currencies. First of all, one needs to distinguish between the complementary currencies with a social, economic or environmental goal. In case of an economic purpose, it might stabilise the monetary system but only if the size of the network of the complementary currency is large enough. Junior Smets

pointed out that the RES was still too small, compared to the WIR system, to stabilise the global economy of Belgium even though it would certainly help the RES members in case of a new crisis.

Further analysis is needed in the future of different and various complementary systems once they will have reached higher levels of turnover in order to confirm our preliminary conclusions.

## Conclusion

In this thesis we have addressed the following questions: Is the monetary system viable? What are the alternatives? Can complementary currencies bring more stability and sustainability? To answer those questions, it was first necessary to define the term money as money lies at the core of the monetary system. Based on our research, we came up with the following definition of money: a standardised item, either digital or tangible, which is both a flow and a stock, trusted by people from a community, who agree to use it as a medium of exchange in their transactions.

Nowadays, fiat money attached to a positive interest rate is the largest type of money in circulation. This means that the most common currencies are legal tenders that are not backed by any commodity. Therefore, the faith people have in the governments issuing the currencies is extremely important as this is the main condition for the survival of those currencies. As Professor Bruno Colmant suggests, money lives only as long as it can gather enough believers.

Money and money supply deeply affect economic mechanisms such as business cycles, inflation and interest rates which impact people in their daily life. We identified four main functions of money which are: 1) money as a medium of exchange, 2) money as a unit of account, 3) money as a store of value, and 4) money as a standard of deferred payments.

Once the term money was defined, we were able to address the first main subject of this thesis: is the current monetary system viable? Monetary systems can be defined as follow: “any formal structure adopted by a government that issues a currency which is accepted as the medium of exchange by its citizens and by other governments” (Investor Words, 2016). The monetary system includes four pillars that interact with each other: 1) a central bank, 2) commercial banks, 3) the bond market, and 4) the government. The current monetary system has been essential in the industrialisation transition and has resulted in rapid and massive economic growth. However, the multiple drawbacks like short-term vision, deterioration of social connection and community, need for endless growth, inequalities of wealth concentration, pro-cyclical tendency of money creation, and flow of the current monetary system show us that it does not address all the challenges of today’s world and starts showing its limitations.

According to Bernard Lietaer, the main issue of the monetary system is “the monopoly of a single type currency created by the banking system through loans attached to positive interest rates [debt]” (Lietaer, What is the problem with our current money system, 2010). It is not

flexible enough and is only adapted for transactions in the classic sectors and between conventional economic agents. Complementary currencies are an alternative that could deal with some of these shortcomings as they are usually not driven by positive interest rates but tend to encourage cooperation between people. They would also allow people to complete transactions that benefit everyone while eliminating the competitive aspect. Moreover, it would make the current monetary system more stable as it would rely on several currencies which are better adapted to certain type of transactions and which will open up the monetary system to organisation outside of a small group of financial institutions who currently seels the monetary system (Lietaer, What is the problem with our current money system, 2010). It would end the monoculture and make space for a system with multiple currencies which each have a different finality. Finally, these complementary currencies would give more importance to the cooperative economy which nowadays relies mainly on the subsidies received from the competitive economy, fuelled by its scarce currency attached to positive interest rates.

Obviously the actual monetary system is not entirely bad and the complementary currencies do not have the ambition to replace the actual monetary system but rather to reduce or eliminate the defaults of the current system. Several examples of complementary currencies whit different goals exist and were discussed to give a clear idea of what a complementary currency and its objectives are.

Another type of alternative to the current monetary system is cryptocurrencies and its blockchain technology. The blockchain technology is a disruptive technology in the financial world in the sense that people make (international) transactions without using traditional financial institutions. Nowadays, some banks can show abusive traits due to their close connection to the political world. Introducing an apolitical cryptocurrency technology could help create a neutral and free currency market (Scott, 2016). However, it is important to stress out the fact that cryptocurrencies are facing multiple shortcomings mainly related to their high volatility and speculative traits which will have to be fixed to become a viable and sustainable alternative to the current financial system.

We also addressed the feasibility to combine both concepts leading to complementary currencies supported by the blockchain technology. This idea aligns with the belief of Professor Diniz who sees digitalisation as an important factor in the implementation of complementary currencies. Digital complementary currencies offer multiple advantages that can boost their expansion and growth. The main objective is to reduce the costly and cumbersome management

of complementary paper currencies. Even though initiatives related to complementary cryptocurrencies are still in their early stages, they confirm the trend that complementary currencies supported by the blockchain technology are technically feasible. These could also take advantage of the blockchain technology that is nowadays mainly used for speculative behaviors like Bitcoin. However, it is important to mention that the success of complementary currencies depends on the issue they want to tackle and the community in which they will circulate. Therefore, using the blockchain technology or even digital currencies will not always be adequate. A main example of this is the Toreke project in Ghent where the introduction of a digital currency was a failure.

Interviews with representatives of the Toreke project in Ghent and the RES in Leuven gave us more insight on how complementary currencies work and what their impact is on the society and the economy. These two projects prove that these concepts can be implemented in our economy and are a source of benefits. We have also witnessed through our field research that each complementary currency tends to typically address one particular issue faced by certain people in the current economic and monetary system and this concept of bottom-up currencies shows strong potential.

Finally, we would like to conclude that even though complementary currencies are still in an “early adopter” phase, the awareness around them is expanding. However, we believe that at a bigger interest from the economic agents of the actual monetary system such as commercial banks, central banks and the political world is needed in order to develop them even more. Some examples already exist with the Banco Palmas initiative where commercial banks, central bank and the government are part of the project or the involvement of the European Commission with the D-Cent project. These few examples allow us to believe that major players start to see the benefits of complementary currencies which will play a more important role in our economic and monetary system in the near future.

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<b>Appendix</b>
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### **A.1 Terms of the Bond Market**

- Par value: “The par value of a bond is usually \$1,000, which is the face amount at which the issuing entity will redeem the bond certificate on the maturity date” (Bragg, 2010).
- Coupon rate: “Coupon rate is the rate of interest paid by bond issuers on the bond's face value. It is the periodic rate of interest paid by bond issuers to its purchasers. The coupon rate is calculated on the bond's face value (or par value), not on the issue price or market value” (The Economic Times, 2017).
- Maturity date: “This is the date on which the principal amount of a bond is to be paid in full. A bond’s maturity usually is set when it is issued” (InCharge Debt Solutions, 2016).
- Yield is the last concept that needs to be explained, in order to understand fully the yield of bond, it is preferable to divide it into three categories
  - “Nominal Yield: This is the coupon or interest rate. Nothing else is factored into this number. It is actually not very helpful” (Little, 2016).

“Current Yield: The current yield considers the current market price of the bond, which may be different from the par value and gives you a different return on that basis” (Little, 2016).

“Yield to Maturity is the most complicated, but the most useful calculation. It considers the current market price, the coupon rate, the time to maturity and assumes that interest payments are reinvested at the bond's coupon rate” (Little, 2016).

### **A.2 History of the Gold Standard**

England is one of the first countries to adopt the gold standard in 1819 (Bordo, Gold Standard, 2008). In the United States, they didn’t start with a gold standard but with a bimetallic standard between 1792 and 1834. Both silver and gold were used to define the monetary unit. In reality, silver coins were more used than gold coins because gold and silver were set in value to each other at a ratio of 15 to 1 while the market value was at 15 <sup>1</sup>/<sub>2</sub> to 1 resulting in gold leaving the country (Holmes, 2015). In 1834, the Congress wanted to remove the problem of 15-1 silver-to-gold ratio. To do so, they changed the silver-to-gold ratio from 15-1 to 16-1. The result of that change in ratio was that gold became more expensive relative to the world market price ratio and silver coins were exported and gold coins imported leading to the opposite situation. With the discovery of gold in California and in Australia, this phenomenon was increased and

silver coins almost disappeared from the United States in 1850. Therefore, the bimetallic standard of the United States became basically more a gold standard (Elwell, 2011).

In 1850, it was quite common that paper notes were issued. Indeed, even though those paper notes were not legal tender, people trusted the fact that those notes could be exchanged at any moment in time into gold or silver. During the Civil War of 1862, the United States abandoned the basically gold standard as they faced financial difficulties due to the Civil War. For the first time, a fiat money called greenback was used with the only exception being that custom duties were paid in gold. Once the Civil War was over, the government decided to get back to the basically gold standard using the same parity as before the war. People could exchange their greenbacks against gold or silver in marketplaces but the government was not able anymore to maintain the gold and silver at their mint price. The problem was that the United States printed out too many greenbacks and could not reimburse all of them in gold. Therefore, greenbacks were partially removed from circulation. In 1879, their number was frozen to \$347 million (Elwell, 2011).

In 1871, Germany officially adopted the gold standard and created a network effect. Their goal was clear: motivating other countries to also adopt the gold standard in order to not get stuck with devaluated silver coins and not to buy gold at high costs as the ratio of 16-1 was still present in the United States (Johnston, 2015).

In 1879, the United States adopted a “classic” gold standard. They arrived to that because when they wanted to get rid of the greenbacks, they omitted the possibility to convert it into silver. This mistake had an enormous consequence as it eliminated completely silver. (Elwell, 2011)  
In 1900, some investors were concerned that the value of silver might increase again and that the United States would go back to a bimetallic system. If it would have happened, people would have paid their debt back in silver. This led to some instability on the market. Therefore, the government reaffirmed its commitment to the gold standard with the Gold Standard Act<sup>36</sup> (Holmes, 2015).

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<sup>36</sup> President William McKinley signed the Gold Standard Act, which established gold as the sole basis for redeeming paper currency. The act halted the practice of bimetallism, which had allowed silver to also serve as a monetary standard. It set the value of gold at \$20.67 an ounce and valued the dollar at 25.8 grains of gold. (Glass, 2013)

The gold standard was implemented in most countries at that time and this lasted until World War I. When World War I started in 1914, all the countries that were engaged in the war with exemption of the United States stopped redemption rights. People could no longer go to the bank and convert their money (Pounds, Franks, Dollar...) into gold. Governments started to print money intensively in order to finance WWI. The United States were able to keep the gold standard as international monetary system under the impulsion of the Federal Reserve.

At the end of WWI, most of the big countries wanted to get back to the gold standard where gold could be exchanged at pre-war parities. Nevertheless, it did not succeed and the system changed a bit. Indeed, firstly it was named the "Gold Exchanged Standard". Countries could keep reserves under the form of gold, pounds and dollar with an exemption for the United States and the United Kingdom which could only hold their reserve in gold (Bordo, Gold Standard, 2008). As mentioned previously, the pre-war parities were not achieved. To give an example, the Federal Reserve was allowed to put 50\$ worth of claim checks on gold currencies in circulation backed-up by only 20\$ worth of gold. It was a 40% reserve ratio. So, for any 20\$ worth of gold they could put 50\$ in circulation.

This system did not last long and was characterized by the Great Depression, banking crisis and recessions. The decision from Britain in 1931 to leave that "Gold Exchange Standard" in order to prevent massive gold and capital outflow led that system to an end (Bordo, Gold Standard, 2008). In 1933, under President Franklin D. Roosevelt, the "Gold Exchange Standard" was ended for the United States. The reason behind this choice is that the Federal Reserve did not have enough cash to meet the people demand. In order to generate enough cash, they would have needed to make the following decision: create much more money and lower interest rates. Lower interest rates mean that people would have been looking somewhere else to place their gold which would have resulted in export of gold. By creating more money, people would have doubted the ability of the United States to remain on gold. Doubt is never good for an economy. It would have led to export of gold which means that the reserves would decrease too leading to the fact that it is more complicated to keep the dollar at its legal gold value. For those reasons, the United States could not make such a decision leading to the end of the "Exchange Gold Standard" and by the same time of the original model of the "gold standard". This period between WWI and WWII is also known as the interwar period (Elwell, 2011).

### **A.3 History of the Bretton Woods System**

As mentioned previously, the gold standard never recovered from WWI leading the international monetary system in an interwar period. Countries needed extra money to finance war and therefore decided to get off the gold standard. By printing extra loads of money, government and central banks created hyperinflation. The quantity of money demanded was far inferior to the money supply. Therefore, money lost its value and it reached a certain point where a wheelbarrow was needed just to buy some bread (Amadeo, Bretton Woods System and 1944 Agreement, 2017). After the WWI, countries who went out of the gold standard wanted to get back. Even though they did not get back to the original gold standard but to a derivative one, it was working reasonably well until the Great Depression of 1929 when the stock market crashed. The choice made by the Federal Reserve to defend the gold reserve of the country by increasing the interest rates brought the gold standard to an end. The Great Depression spread, through the gold standard, to Europe. It took a lot of time to recover from the Great Depression and when the countries that were hit by it finally recovered, WWII was upon them (Histroy, 2009).

During both wars, Europe paid the United States with gold. During WWI, the United States did not get involved in the war until the very end of it. So, during the first four years, the United States were selling all their consumer goods and grains to Europe and received gold in exchange. Then, just before WWII, Hitler starts sabre-rattling in 1936 before invading Austria in 1938 and Poland in 1939. Once again, the United States did not get involved before Pearl Harbour in 1941 while Europe was already fighting. So again, there is six-year time-period during which Europe was paying the United States in gold in order to receive consumer goods and grains. This is where the Americans have this popular myth that war is good for the economy. War is good for the economy of a country if that country is not stuck in it and sells to the other countries the tools of the trade. By the end of WWII, this trade between Europe and the United States had the following result: 2/3 of the world's gold was owned by the Unites States. The rest of the world had 1/3 and Europe none. The interwar monetary system was therefore not going to work anymore, it would collapse. United States made all the loans to Europe so Europe was flooded with dollars. In order to establish a new monetary system, representatives from all around the world, met at Bretton Woods (Maloney, 140 Years Of Monetary History In 10 Minutes, 2013).

The main goal for all the representatives present in Bretton Wood was the following one: “Those at Bretton Woods envisioned an international monetary system that would ensure exchange rate stability, prevent competitive devaluations, and promote economic growth” (Kollen, 2013). Developing a new international monetary system was an enormous international undertaking. Indeed, even though the goal to be reached was clear and accepted by all, representatives did not agree on how it should be implemented. The preparation of the Bretton Woods Agreement started two and a half years before the gathering where experts from all around the world met in order to determine the best way to implement it. Although the forty-four allied nations and Argentina who had a neutral government participated to these meetings, the United States represented by Harry Dexter White of the U.S. Treasury and Great Britain represented by John Maynard Keynes dominated the discussion and developed two rival plans (Cohen, 2015).

Keynes wanted to create a central bank called the Clearing Union which would have been able to issue a new international currency the “bancor”. The role of that institution would have been to correct imbalances. He based his plan on the following idea: “*The United States would experience another depression, causing other countries to run a balance-of-payments deficit and forcing them to choose between domestic stability and exchange rate stability*” (Kollen, 2013). White also wanted to create a new institution called the Stabilization Fund that would have limited power and resources. Instead of a new currency, “*the Stabilization Fund would be funded with a finite pool of national currencies and gold of \$5 million that would effectively limit the supply of reserve credit.*” (Kollen, 2013) The different meetings led to a compromise between both countries. The final result was much closer to White’s plan showing the overwhelming power of the United States as WWII was coming to an end.

As mentioned previously, the Bretton Woods Agreement resulted in two new institutions and a new monetary system. Indeed, the representatives agreed to create the International Monetary Fund and the International Bank for Reconstruction and Development which is now the World Bank. The IMF saw the daylight in December 1945 when the Articles of Agreements were signed by its first twenty-nine members. They all accepted to keep their currencies fixed but adjustable (maximum of 1%) to the dollar which was fixed to gold at 35\$ an ounce (Kollen, 2013).

It took time before the new international monetary system was fully operational. Indeed, it was not the case before 1958. At that point, dollars could be exchanged at 35\$ an ounce and the

United States goal was to keep the price of gold fixed and to maintain confidence in gold convertibility by adjusting the dollar supply (Kollen, 2013).

Under the Bretton Woods System, there was no reserve ratio established where the United States had to have a certain gold reserve for the amount of dollars created. This allowed the United States to keep printing dollars which resulted in some deficit spending's such as for Korea, Vietnam, Johnson's "Great Society" and expanded the money supply and exported it everywhere in the world. During the sixties, the French president Charles de Gaulle realised that the United States did not have the gold to back-up the dollars (Maloney, 140 Years Of Monetary History In 10 Minutes, 2013). He had the following speech: "*The fact that many countries accept as a principle dollars being as good as gold leads Americans to get into debt and to get into debt for free at the expenses of other countries because what the United States owes them is paid with dollars they are allowed to emit. We consider it necessary that international trade be established, as it was the case, before the great misfortunes of the World on an indisputable monetary base and one that does not bear the mark of any particular country*" (Maloney, 140 Years Of Monetary History In 10 Minutes, 2013). France thus decided to exchange back their dollar into gold. At that point, other countries started to jump on board and also asked for their gold. The United States lost at that point 50% of its gold from 1951-1971. But the United States still had about twelve times more dollars than their gold reserve value.

The Bretton Woods System started to collapse in 1971 when the United States faced stagflation<sup>37</sup>. President Nixon wanted to take action against stagflation that occurred partially due to the dollar that served as global currency. Therefore, he decided to change the gold-dollar ratio to 1/38 per ounce then even 1/42 per ounce. His whole plan backfired as people started to exchange their devaluating dollars against gold. It became worse and the gold was sold at 120\$ per ounce on the free market. This marked the end of the Bretton Wood System. On 15 August 1971, Nixon decides to end the convertibility of gold and dollar. This marked the end of the Bretton Wood System (Amadeo, Bretton Woods System and 1944 Agreement, 2017)

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<sup>37</sup> Persistent high inflation combined with high unemployment and stagnant demand in a country's economy. (Oxford Dictionaries, 2017)

### A.3.1 Role of the IMF

As mentioned previously, Harry Dexter White wanted to create the Stabilization Fund which would be funded with a finite pool of national currencies and gold of \$5 million that would effectively limit the supply of reserve credit. It was not called the Stabilization Fund but the IMF. Representatives decided not give the IMF the power to print money when needed but they agreed to finance the finite pool. Certain countries needed the IMF to bail them out when the value of their currency was too low. Indeed, otherwise they would have raised the interest rates which would have affected international stability which was the opposite of what was agreed. Nevertheless, some rules existed. Indeed, countries could only borrow a certain amount that would depend on their contribution to the finite pool. Last but not least, the IMF was also in charge of enforcing the agreement between the different nations. Without the IMF, it is clear that the Bretton Wood System could not work (Amadeo, Bretton Woods System and 1944 Agreement, 2017).

### A.3.2 Role of the International Bank for Reconstruction and Development

The International Bank for Reconstruction and Development or the World Bank as it is known today had the mission to lend money to European countries that were devastated by the WWII. The only purpose was to rebuild these countries. The World Bank has now a different role which consists in lending money to bring projects to an end in emerging markets (Amadeo, Bretton Woods System and 1944 Agreement, 2017)

## A.4 Field Research: Toreke Project

### A.4.1 Interview with Anissa Boutiebi

(Boutiebi, 2017)

H: Goeiemiddag, alvast bedankt om tijd voor ons vrij te maken.

A: Geen probleem, ik ben zelf ook net afgestudeerd en heb ook een thesis moeten afgeven.

H: Vooraleer we vragen stellen, zal ik het eerst even hebben over onze thesis. Mij hebben drie grote hoofdstukken. We beginnen met een definitie te geven over geld. De meeste mensen denken dat ze geld perfect begrijpen omdat ze het dagelijks gebruiken maar in werkelijkheid is geld complexer dan dat. We hebben het nadien over het actuele monetaire systeem en zijn beperkingen. Ten laatste geven we verschillen oplossing om de actuele systeem te verbeteren.

A: Ik zal misschien eerst beginnen met het Torekes project uit te leggen. Ik ga beginnen bij het begin. Torekes project is gestart in 2010. Hoe is dat gestart? Het was eigenlijk de minister die hier was destijds, Kathleen Van Brempt, zij speelde met de idee van een complementaire munt. Maar zij was in de laatste ambt van haar ministeriële termijn dus ze kon dat niet realiseren. Haar opvolgster, Freya Van den Bossche, zij is er dan verder mee aan de slag geweest. Zo is dan ook Bernard Lietaer in de samenwerking bijgekomen. Hij heeft de munt ontworpen, het economisch systeem en het monetaire systeem erachter in 2010. Het is een munt die enkel bestaat hier in Rabot. Waarom deze wijk specifiek, deze wijk is de armste wijk van heel Vlaanderen. Althans dat was zo in 2015, misschien is dat nu op de tweede plaats gekomen of zo maar het behoort nog steeds tot een van de armste wijken. Er zijn hier veel problemen met drugs, veel mensen met een zeer laag inkomen. Het is hier een zeer rijke buurt aan etniciteit waar er maar weinig Belgen overblijven. Het is eigenlijk een beetje een wijk met heel veel problemen en verschillende zaken die je in andere wijken niet vindt maar de wijk heeft ook heel veel potentieel. Verschillende culturen heeft er ook voor gezorgd dat er heel veel talent hier is in de buurt. Talent die door de gewone maatschappij niet wordt gezien als talent maar dat wij tonen dat het wel talent is. Je hebt hier heel veel lokale organisaties, heel veel lokale handelaars die echt wel door de buurt worden gebruikt en die door dit project ook een duwtje in de rug krijgen. Dus inderdaad, het is soms een probleem maar het heeft ook veel potentieel. Vandaar ook de keuze om in deze wijk aan de slag te gaan en eigenlijk op die manier ook een beetje te experimenteren waar de wijk/munt naartoe zou gaan. De munt is geïnspireerd op drie pijlers. Namelijk buurtzorg, burenzorg en milieuzorg. Met buurtzorg proberen we ervoor te zorgen dat de wijk een mooiere wijk wordt, betere wijk wordt, aangename wijk wordt en dit wordt gedaan door de buurtbewoners zelf. Dit kan gedaan worden door bijvoorbeeld zich te organiseren om de straten te kuisen, door jongeren voetballessen te geven om ze van de straat weg te houden, mensen die de gevel van hun huis gaan schilderen om hun straat mooier, kleurrijker te maken. Dat kan zo verder gaan, allerlei dingen die de buurt beter maken.

H: Moeten ze eerst naar hier toekomen vooraleer ze met zulken projecten starten?

A: Ik ben dus het aanspreekpunt voor het project. We maken daarbij heel veel reclame rond. Als mensen via via horen dat dit project echt bestaat komen ze naar hier. Ik leg hen uit wat het project is, wat ze kunnen doen en afhankelijk van de activiteit die ze willen doen gaan wij vrijwilligers contracten opmaken, leggen de missie en de visie uit van het project, hoeveel Torekes ze verdienen per uur, alles wordt uitgelegd. Eens dat dat is geregeld, kunnen ze van

start gaan. Je wordt beloond via Torekes en aan die Torekes hangt een euroconversie. De vrijwilligers moeten zich aan de regels houden zoals hoeveel uren ze kunnen werken en welke bedrag in Torekes ze hiervoor krijgen en als je bijvoorbeeld een leefloon ontvangt of invaliditeit uitkering moet er eerst toestemming gevraagd worden om vrijwilliger te kunnen worden. Wij hangen dus nog altijd met de regels vast, daarom moet ze ook bij mij terecht komen zodat ik alles kan controleren (statuut, wat ze kunnen doen...).

H: Wat is de conversie tussen een Toreke en een euro?

A: 1 euro is 10 Torekes en dus 1 Toreke is 10 cent We zijn nu ook bezig met een nieuw biljet te maken van 5 Torekes dat een equivalent zal zijn van 50 cent. Die zal hopelijk in september beschikbaar zijn.

N: Waar worden ze gemaakt?

A: Wij laten die maken bij een drukker. Der is een drukker die de eerste brieven heeft gemaakt, ik kan deze ook laten zien. Zij hebben dus dat gedaan en net zoals bij een festival is er een zilveren ding erop voor de beveiliging en dat niet iedereen het zo maar kan namaken met een nummer, de gegevens van het heeft gemaakt.

H: Is het echt veilig?

A: Het is dus met een watermerk, alle een zilverfolie diagram waardoor het iets moeilijker wordt om dat na te maken. Want dat kost heel veel geld en dat kan je enkel bij een professionele drukker laten doen. Dus een amateur van de straat die kan dat niet doen.

N: Hoe kunnen ze de Torekes wisselen tegen euro's?

A: Normaal gezien is dat verboden voor particulieren. Waarom? Als we dat gewoon dit gaan beginnen wisselen tegen met euro's dan zijn we de bedoeling kwijt van de complementaire munt en gaat dat munt crashen omdat als er constant wordt gewisseld met euro's gewoon is er geen complementaire munt meer. Dus, onze regels verbieden om dat te doen maar natuurlijk wat de mensen op straat doen kunnen we niet controleren. Als zij iemand tegenkomen dat willen ruilen voor euro's kunnen ze dat doen, ik heb hierop geen zicht.

H: Die Torekes kunnen ze nadien ook gebruiken in lokale handels?

A: Je hebt verschillende manieren waarop je Torekes kan verdienen. Het is volgens de drie pijlers. De eerste hebben we al besproken. Nadien is er burenzorg waar burgers elkaar kunnen helpen. Bijvoorbeeld iemand die slechte benen heeft en de buurt doet boodschappen voor hem, babysitten, huiswerkbegeleiding. De laatste pijler zijn de milieuzorgen zoals regenwater opvangen, geen reclame meer ontvangen. Via die drie luiken kan je Torekes winnen die kunnen uitgegeven worden bij lokale handelaars, bij een boerenmarkt die we hebben, ook bij mij bij de Torekes. Ik hou een Torekes loket open. Bij mij kunnen ze biljetten kopen voor openbaar vervoer, cinematickets, grief om te tuinieren zoals handschoenen, van alles en nog wat, voetbal en ze kunnen ook Torekes aan elkaar uitbetalen zoals voor de burenzorg en ze kunnen ook naar sociale restaurants terecht. Wij hebben twee sociale restaurants die deelnemen. Het is eigenlijk een hele lijst hoe je ze kan verdienen en hoe je ze kan uitgeven. Wij staan ook altijd open dat de burgers natuurlijk zelf ook inspraak hebben en als zij iets hebben dat ze al doen, activiteit maar die nog niet door ons geregistreerd is, zijn ze altijd vrij om tegen ons te komen zeggen en dan bekijken we dat en nemen we dat eventueel mee op.

H: Hoe weten ze welke lokale handelaars meedoen, krijgen ze een lijst, staat er een affiche bij de handelaars?

A: Er bestaat een website waar ze alles kunnen bekijken maar ook bij de handelaars zelf hangt er zo een paneel uit, er hangen stickers op de ramen waar dat er opstaat dat ze mee doen aan het Toreke project en we communiceren het ook mondeling. Op die manier weten ze het. Als er een nieuwe handelaar, het eerste dat we doen voor dat handelaar en voor ons is heel veel reclame errond doen. Dus overal affiche hangen dat er een nieuwe handelaar is dat de mensen op de hoogte zijn dat er een extra handelaar is.

H: Is er ook een nieuwletter of zo?

A: Wij hebben ook een nieuwsbrief die om de 3 maanden worden geschreven. Daar worden alle nieuwigheden aangekondigd, belangrijke zaken die zijn gebeurd. Op die manier worden mensen op de hoogte gehouden.

N: Waarom gebruiken jullie papierengeld en geen digitaal geld?

A: Het Torekes Project is een project dat heel erg geïnspireerd is op burgerparticipatie. Wij betrekken de burger bij beslissingen, wij geven hen inspraak, ze hebben recht om hun mening te geven om het de munt is van de wijk. Dus automatisch hebben ze hierover ook iets te zeggen.

In het begin deden ze een rondspraak of ze papier of digitaal wilden gebruiken. Ze hebben gekozen om een papieren versie te gebruiken. De reden hiervoor is dat we hier in een arme wijk en voor vele mensen is de drempel van een smartphone veel te hoog en mensen zijn het gewoon om iets in hun handen te hebben met Torekes hebben ze dit effectief. Zij hebben het vast. Een paar jaar later hebben we wel een digitale versie ingevoerd. Toch noch op vraag van andere mensen hebben en digitale versie ingevoerd. Deze loopt nog steeds maar wij gaan bijna er een einde aan zetten omdat mensen deze ook niet gebruiken. De drempel is te hoog, mensen die smartphones hebben gebruiken die om op sociale media te gaan maar als het gaat om andere functie weten ze niet hoe ze ermee moeten werken. Senioren hebben vaak geen smartphone maar vaak een gewone telefoon waar ze enkel mee kunnen bellen of sms'en. Deze digitale versie was meer gevraagd door de middenklasse maar uiteindelijk leek het niet te draaien.

N: Is het duur om digitaal geld in te voeren?

A: Heel duur want je betaalt de App, de rechten erop moeten ook betaald worden, de ICT moet betaald worden, het abonnement die er aan vast hangt. Dus de kosten lopen wel op. Papiergeld laten maken is ook duur maar het is een éénmalige investering daarna is het gedaan.

N: Zijn er taxen op de activiteiten die worden verricht door de vrijwilligers?

Nee, er worden geen belastingen erop betaald. Waarom? Omdat dit valt onder de vrijwilligers regels. Vrijwilligers betalen ook geen belastingen zolang dat ze onder een bepaald aantal bedrag blijft en dat je kan verdienen en uren.

H: Dan krijg het project subsidies van Gent om zich te financieren?

A: Het project wordt voornamelijk gefinancierd door de stad Gent.

H: Krijgen jullie ook donaties van privépersonen?

A: Nee dat krijgen we niet. We krijgen alles van de stad Gent. Voor de rest proberen we zelfvoorzienend te zijn. Bijvoorbeeld, wij staan het wel toe aan organisaties om Torekes te kopen omdat zij daar vrijwilligers hebben en ze betalen hen ook met Torekes. Op die manier is dat voor ons weer winst in de Torekes pot. Voor de rest zijn wij afhankelijk van de subsidies van de stad Gent. Wij werken niet met donors. Het is ook moeilijk om het te vragen aan mensen van de wijk omdat ze al moeilijkheden hebben om water en brood op tafel te brengen bij wijze

van spreken. Doneren is vaak te moeilijk en aangezien het een project is in de wijk is het moeilijk om donaties te vragen aan mensen buiten uit omdat ze er niets aan hebben.

H: Wat is het percentage van mensen uit de wijk die meedoen?

A: Ik heb het opgezocht, in 2015 waren er 4653 uren aan vrijwilligers werken gedaan met soms pieken van 110 mensen per dag en gemiddeld 68 mensen per dag en daarbij spreken wij van werkdagen hierbij op de site bij de stadsakker. Daar is het altijd en seizoen die wij hebben van maart tot oktober waar mensen in de stadsakker kunnen komen werken. Wat doen ze daar? Oogsten, planten, groeien, fruiten, ze hebben een eigen privétuin die ze kunnen huren en door daar te werken verdienen ze Torekes. Dus deze uren opgesomd is betreffend op de site. 2016 was 2835 uren en vandaag de dag heb ik gekeken zitten we ongeveer met 350 deelnemers. Dus we bereiken niet heel de wijk maar ik zou zeggen 1/30 van de wijk.

H: Hebben jullie plannen om de rest van de wijk meer te betrekken?

A: De meeste mensen die hier meedoen zijn mensen hier in de buurt. Het verspreid zich vooral lokaal mond aan mond maar we houden zelf ook infosessies, er zijn ook veel flyers op straat. Ik heb hier nu ook een nieuwe affiche laten maken die op straat gehangen zullen worden en grote borden. Mensen lezen dat, zien dat, raken daardoor geïnteresseerd.

H: Kennen mensen uit Gent dit project of enkel mensen van de buurt?

A: Buiten de wijk zijn het vooral intellectuele of mensen die zich interesseren in de economie of complementaire munten die er wel van weten. Er worden heel regelmatig lezing georganiseerd waar ik dan vaak uitgenodigd wordt om te spreken en je merkt dan ook dan de doelgroep, de mensen die hierop afkomen zijn mensen die bezig zijn met economie of mensen die begaan zijn met de thema van de euro en alternatieven systeem. Dus buiten Gent en buiten de wijk zijn het vooral mensen meer hoogopgeleid zijn die de Torekes kennen. Dat is naar mijn perceptie.

N: Hebben lokale handelaars een positief effect gevoeld met de Torekes?

A: Ja, ze krijgen meer klanten dus dat helpt hun en ze maken geen verlies want de producten die ze meegeven aan de klanten die met Torekes betalen krijgen zij teruggestort op hun rekening in euro's waardoor de handelaars geen verlies leiden en meer klanten hebben en onze vrijwilligers hebben een manier om hun Torekes uit te geven. Nu probeer ik zelf ook wel het

geld meer te laten circuleren want de beweging maken van de mensen naar de winkel gaan met de Torekes, ze betalen iets en wij storten dan terug aan de handelaar dat maakt niet genoeg circulaire bewegingen. We zijn er nu aan het denken om de Torekes die handelaars krijgen niet te laten omruilen in euro's maar dat ze het gebruiken om iemand de ramen te laten doen en hiervoor Torekes te geven. Een ander voorbeeld zou zijn om te helpen uitladen van de winkel. Zo een soort zaken zodat het langer blijft ronddraaien want wat we wel merken met de Torekes project in wanneer het naar de winkel gaat maakt het niet genoeg circulaire beweging. Als het onder de mensen blijft wel. Zodra het naar de winkel gaat stopt het daar en krijgen ze hun euro's. En daar willen wel meer van afstappen zodat het meer circuleert want we zetten daar wel veel euro's in. We zitten met een zilver pot per jaar van 22000 euro's dus dat is 220000. We willen dus dat verminderen zodat er meer van het budget overblijft om andere zaken te doen.

H: Wat denken jullie van een omzetting taks om hieraan te vermijden?

A: Ik heb hierover nog niet echt over gedacht om belastingen erop in te voeren omdat ik heb met ons boekhoudster gesproken en zij zegt dat we tot nu toe met de Torekes project buiten de belastingen zijn. We staan er dus volledig los van. Dat zou eventueel geïntroduceerd kunnen worden maar dan zou ik samen moeten zitten met de boekhoudster om te kijken wat de wetgeving hierover zegt en hoe we dat zouden kunnen doen. We willen ook vooral handelaars de vrije keuzen geven van of ze dat gewoon willen terugkrijgen of ze die circulaire beweging weer doen. In ons opzicht als je je kijkt naar onze Torekes filosofie bast het beter in ons kader om andere manier te munt meer te laten circuleren omdat wij vertrekken vanuit een duurzame, lokale filosofie, burgerparticipatie, inspraak. Belastingen invoeren en ze op die manier dwingen om meer te laten circuleren is niet de bedoeling. We gaan graag in de dialoog, we praten graag en wij kijken samen wat ze nodig hebben, waaraan ze de Torekes kunnen geven om het meer te laten circuleren.

H: Wat is de impact om de mensen van de Torekes project?

A: De Torkes hebben een zeer groot impact, en zeer grote waarde voor de mensen hier in de buurt. Zoals ik al zei, dat zijn mensen die heel weinig hebben en voor hun, ze hebben het gevoel dat de euro faalt voor hen. Waarom? Zoals we het ook noemen, de meerderheid van de mensen die hier wonen zijn time-rich money maar cash-poor mensen. Dus ze hebben zeer veel tijd maar geen geld. En daarin faalt de euro voor hen want de euro zoals we het kennen kan je enkel

winnen door te werken. Als je niet werkt, heb je geen geld. In hun geval is het anders, ze zitten met een ziekte-uitkering, of ze raken maar niet tewerkgesteld omdat de VDAB een beeld heeft over hun dat het mensen zijn waaraan je niets meer kunt aanleren. Ze zijn vaak analfabeet, ze kunnen niet lezen of schrijven maar ze hebben wel talenten maar deze talenten worden niet herkend door de maatschappij. Bijvoorbeeld, een heel groot deel van de wijk hier zijn mensen van Turkse origine van landbouwstreken. Dus het zijn mensen die heel erg veel kennis hebben over agricultuur. Ze kunnen heel goed tuinieren, ze hebben groene vingers, ze hebben heel veel kennis over hoe ze grond moeten bewerken. Maar als je kijkt naar onze arbeidsmarkt, met talenkennis die ze niet hebben, raken ze maar niet aan de bak. Er is hier heel weinig werk rond en de communicatie verloopt erg moeilijk. En dus op deze manier zijn ze afgestemd tot niet actieve burgers, je kunt ze niet bijleren en het zijn mensen vanuit je niets kunt aanvragen. En nu door dit project hebben ze toch de mogelijkheid gekregen om gezinnen te onderhouden, om kinderen hun schoolboeken te kopen, eten op school te laten kopen door de Torekes. Dus voor hen is de impact van deze munt is enorm waarbij ze voorheen echt moeilijkheden hadden om eten te kunnen voorzien en maaltijd van kinderen op school te kunnen betalen dat kunnen ze wel nu via de complementaire munt. Dus voor hun werkt de euro niet.

H: Hoeveel Torekes verdient ze per uur?

A: Ze krijgen 25 Torekes per uur. We letten er wel ook op dat er een heel dunne lijn is tussen vrijwilligers werk en goedkoop arbeid want dat willen we absoluut niet dat het een vorm van goedkope arbeid wordt waarbij ze heel zwaar gaan werken en maar 2,50 per uur krijgen. Dat is inhumain en geen juiste ethiek en dus de activiteiten die ze doen, doen ze op hun eigen tempo, op hun eigen manier en zo mogen fysiek niet te belastend zijn. Bijvoorbeeld als ze hier werken in de tuin, kan het soms intensief zijn zoals grond bewerken, ploegen maar ze hebben wel een vrijheid. Het is niet zoals een echte job waar ze aanwezig moeten zijn van dat uur tot dat uur en dat je constant aan een stuk moeten werken. Als ze zich niet goed voelen, kunnen ze naar de kant, stoppen ze. Door Torekes project heeft het woord werken een heel andere definitie gekregen. Door Torekes project zijn we het woord werken in vraag gaan stellen want wat is werken. Wij kennen werk alleen op het manier waarop het bestaat. Je hebt een contract, je moet van die uur tot die uur werken en aanwezig zijn. Door ons heeft werk een compleet andere mening gekregen. Mensen komen wanneer ze zin hebben om te komen, wanneer ze zich goed voelen. Voor de Torekes voelden mensen zich zeer geïsoleerd, ze leefden vaak in eenzaamheid, kenden de buurt niet. Nu is de wijk veranderd in een plaats waar mensen leren zich kennen. Ze

hebben terug sociale netwerken. Ze komen naar buiten en doen activiteiten en ze voelen zich gewaardeerd met die dingen en voor ons is het belangrijk dat Torekes niet wordt gezien als geld. Dat kan heel makkelijk gebeuren omdat er een euroconversie is maar we willen dat de mensen het zien als een beloning voor hun inzet in de wijk. Ze hebben terug die sociale netwerk waar ze vroeger niet hadden. Die munt is niet enkel een inkomstenbron voor hun maar het geeft hen een gevoel dat ze belangrijk zijn. Daarvoor werden ze gezien als een inactieve burger, mensen waaraan je niets kunt aanbrenen. Deze munt geeft hen het gevoel: jawel ik ben wel belangrijk en jawel ik kan iets betekenen voor mijn wijk. Het geeft hen meer zelfwaardering over zichzelf, meer een gevoel van een actieve burger te zijn omdat ze niet gewoon thuis zijn, ze zitten bezig in de wijk en ze leren ook met verantwoordelijk te leven. De vrijwilligers die op regelmatige wijze terugkomen, aan hen geven we ook meer verantwoordelijkheid om hen dat te leren. Bijvoorbeeld, die persoon moet in het weekend de groene container openhouden voor de mensen. Dat is een stuk verantwoordelijkheid die we geven en ze leren om ermee te omgaan. Ze hebben ook respect voor materiaal, respect voor elkaar en ze werken op hun manier.

H: Is er enig vorm van controle?

A: Wij proberen zo veel mogelijk te registreren. Gedurende de werkdagen op de stadsakker ben ik er ook en registreer ik alles. Vooraleer ze beginnen werken moeten zijn bij mij komen, hun naam doorgeven en ik schrijf uur van aankomst, wanneer ze weggaan, ik bereken hoeveel Torekes die ze krijgen en 5 minuten voor ze weggaan komen ze langs en geef ik de Torekes. Op die manier proberen we dat bij te houden en te registreren. Natuurlijk kan ik niet op alle plaatsen van de wijk zijn. Dus bij de meeste sterke vrijwilliger deel ik taken uit. Bijvoorbeeld, ietske verder hebben we het boerenhof. Het is hetzelfde principe als we hier hebben, enige verschil is dat het boerenhof werd gebouwd door de wijk en niet door ons. Dus bottom-up gebeurd en de site hier is top-down. Daar hebben wij bijvoorbeeld een vrouw Chantal die verantwoordelijk is daar voor de registratie en die me dat telkens komt afgeven. Zo hebben we dat op meerdere plaatsen waarbij ik dan mensen aanstelt die verantwoordelijkheid op hun opnemen en hiervoor Torekes krijgen.

H: Worden mensen daar dan ook direct in Torekes betaald of moeten ze naar hier komen?

A: Wij hebben een afspraak zoals bv bij Chantal om de maand komt ze bij mij om alle papieren af te geven met registratie en wat ze verkocht heeft. Ik geef haar dan de Torekes mee, ik vertrouw haar dus daarin, en ze betaalt daar de mensen. Ik kan dus niet overal zijn. Het is dus

een relatie op basis van vertrouwen en het zijn ook wel mensen die we weten de we kunnen vertrouwen. Tot nu toe functioneert het wel goed en als we opmerken dat ze hiermee wordt gespeeld of hun verantwoordelijkheid niet goed opnemen dan is het gedaan en krijgen ze het niet meer. Dit vooral voor stad Gent die ons grootste inkomst is, zij verwachten ook die registratie. Want ze hebben zoiets van wij geven jullie geld, dus wij moeten ook weten wat ermee gebeurt.

H: Komt de stad Gent dan vaak ook kijken wat er hier gebeurt?

A: Wij hebben vergadering om de twee weken met mensen uit de stad Gent en met hen overleggen we dan zaken over de project Toreke, de wijk. Er wordt dus wel vergaderd. Het is niet zo dat ze komen controleren maar zij kunnen vragen stellen aan ons en wij kunnen vragen stellen aan hen. Het is een soort van samenwerking.

N: U zei ook dat mensen drugsproblemen hadden, heeft u gezien dat criminaliteit verlaagd heeft?

A: Ik heb hierover geen cijfers, er is ook hierop geen onderzoek gedaan. Maar als ik erop gaat over wat mensen tegen mij vertellen, helpt het hun wel. We hebben bv een ex drugsverslaafde die nu wel clean is. Zijn taak als vrijwilliger is de kippenboerderij. Hij zegt dat deze bezigheid de enig ding is dat hem helpt om niet terug op de straat te gaan op zoek naar drugs. Hetzelfde gaat voor de jongeren die voetballessen krijgen, die jongeren zeggen dat hierdoor niet op straat zijn aan stomiteiten te doen. Echt cijfers hebben we niet, maar het zijn wel positieve activiteiten die ons weerhouden om slechte dinges te doen. We hebben wel een studie laten doen door Universiteit Gent maar het gaat over burenzorg. Wij werken vaak samen met studenten die projecten hebben of willen opstarten en mensen die thesis schrijven.

N: Er zijn meer en meer mensen die naar hier komen?

A: Ja, vanuit Maasmechelen, Parijs, van echt overal, Nederland, België, Spanje. Ze vragen als ze de werking kunnen komen bekijken en wij worden nadien ook uitgenodigd om hun werking te gaan bekijken. Torekes project heeft dus wel internationale aandacht.

H: Bedankt voor u tijd, het was een zeer interessant gesprek over de Torekes project. Wij hebben hierdoor veel extra informatie voor onze thesis.

A: Geen probleem, ik hoop dat ik jullie heb kunnen helpen. Ik stuur jullie dans nog per mail de link naar de studie zodat jullie deze ook kunnen bekijken. En als jullie nog vragen hebben kunnen jullie maar een mailtje doorsturen.

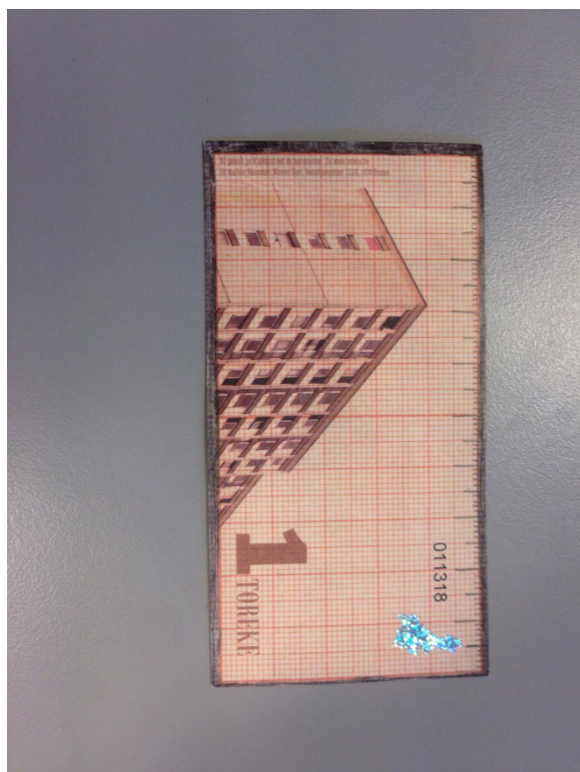
H: Nog eens bedankt en een fijne dag.

N: Bedankt.

A: Tot een volgende keer, daag.

#### A.4.2 Pictures of Our Field Research in Ghent

Front of the 1 Toreke banknote



Back of the 1 Toreke banknote



Front of the 10 Toreke banknote



Back of the 10 Toreke banknote



Poster: wist jij dat je Torekes kan verdienen?

# WIST JIJ DAT JE TOREKES KAN VERDIENEN?

**Wat zijn Torekes?**  
Torekes is de munt van de wijk Rabot-Blaisantvest. Met Torekes worden buurtbewoners beloond die zich inzetten voor de buurt (buurtzorg) of voor het milieu (milieuzorg). De verdiende Torekes kan je weer uitgeven in de wijk bij de lokale kruidenier, gebruiken voor het huren van een volkstuin, om herstellingen aan je fiets te laten uitvoeren, of voor de aankoop van kleren, een busticket of cinematickets, en zelfs voor een dienst van je buur! Op deze manier werken jullie zelf mee aan een aangenaamere, groenere en properdere wijk!

De Torekesloket mogelijkheden: iedere maandag in de Sociale Kruidenier van 17u tot 18u en iedere woensdag van 10u tot 16u op De Site (Blauwe container).  
Meer info op [www.torekes.be](http://www.torekes.be)  
[anissa.boutiebi@samenlevingsopbouw.be](mailto:anissa.boutiebi@samenlevingsopbouw.be)  
of via het nummer 04 89 584 014

**Torekes**  
de munt van je wijk

**Samenlevingsopbouw**  
Gent

**gent:** zoveel stad

VU: Lut Vael, Blaisantvest 70, 9000 Gent

Lend garden in Rabot (de site)



Containers with the necessary materials and a homemade greenhouse



Vegetable inside of the greenhouse



Chicken coop



Football field



## A.5 Field Research: RES in Leuven

### A.5.1 Interview met Junior Smets

(Smets, 2017)

- Nicolas : Wat waren de grootste motivaties en objectieven om het project te starten ?
- Junior: Het is allemaal begonnen 21 jaar geleden door mijn vader. Hij had vroeger horeca instellingen en heeft alles verkocht om in meubelen winkels te investeren. Maar omdat hij niet echt goed de meubelen markt and de specifieke vraag en aanbod kende, lukte het niet echt. Na deze pech, heeft hij besloten om een concept te vinden dat zou mensen in zijn eerder situatie helpen. Hij heeft dus het RES systeem ontworpen. Het is een stelsel of handelaren die business met elkaar doen met RES munt. Wat is merkwaardig, is dat RES munten kunnen niet veranderd worden in euro waardoor het geld in het systeem blijft.

- Hubert: Ja, het RES is een beetje zoals het WIR systeem in Zwitserland?
- Junior: Ja, eigenlijk het RES systeem lijkt erg op dat systeem enkele jaren geleden. Maar nu hebben we ook de consumenten toegevoegd in het systeem. Dit bestaat niet in het WIR systeem. Mensen kunnen nu een RES prepaid kaart bestellen. Het RES business systeem bestaat ook uit twee groepen: de B2C ondernemingen and de B2B ondernemingen waarvan soms verschillende regels toegepast zijn. Er is ook een financiële motivatie voor de consumenten om in RES te betalen. Wanneer ze hun prepaid kaart herladen, krijgen ze 50% meer RES op hun kaart. Het ratio RES/euro is 1:1. Dus wanneer iemand 100 euro betaalt, krijgt hij 150 RES op zijn prepaid kaart.
- Nicolas: Ja we hebben dat gisteren gedaan met onze prepaid kaart. Een vraag daarop is vanwaar komen jullie inkomen zodat jullie zulke financiële offers kunnen aanbieden aan de consumenten?
- Junior: Wel, wanneer een RES handelaar een RES transactie opneemt, moet het 3.5% van het bedrag in RES aan het coöperatieve betalen. Na het tweede jaar, een RES business moet ook 150 RES betalen, enkel als het meer dan 3,000 RES verkopen heeft gedaan gedurende dat jaar. Daarmee kunnen we RES verzamelen en kunnen we deze promoties offeren.
- Nicolas: Moeten de RES handelaars ook belastingen betalen aan de overheid?
- Junior: Ja inderdaad, de RES handelaars moeten dezelfde belastingen betalen als andere ondernemingen die niet in het RES systeem zijn.
- Hubert: Zijn de complementaire munten aan rijpheid gekomen volgens u?
- Junior: Volgens mij zijn we altijd in de “early adopters” phase als jullie het “product adoption curve” bekijken. We zijn nog niet in het “early majority phase”. We moeten nog groeien daarvoor en meer bekendheid krijgen van de mensen. Ik voel dat wel bij sommige mensen dat ze nog niet voor open staan. Ze kunnen ok dat munt niet afhalen (indien het niet uit het systeem kan komen). Ze vragen zichzelf of het systeem zou wel lukken, ze begrijpen het niet goed. Dus, er zijn wel mensen die openstaan voor dat systeem maar er zijn ook andere mensen die altijd zeer sceptisch zijn en die niet meteen aan willen meedoen.
- Hubert: Ja en mensen kennen dat systeem of complementaire munten nog niet goed. Het is een beetje een nieuwe fenomeen voor hen.
- Junior: Ja en nochtans dat bestaat al heel lang. De WIR zijn ze begonnen in 1930, dus die idee van de complementaire munten bestaat al lang maar veel mensen kennen dat

nog niet. Ze zijn nog nooit in contact mee gekomen. Dat is dus een logische menselijke reactie dat mensen niet onmiddellijk openstaan om ermee te starten. Ze willen eerst zien hoe het werkt en dan pas instappen. Dat was ook bij de smartphone zo. Dat kan dus ook zijn dat het bij ons ook komt. Gaat het versneld gaan? Dat weet ik niet, we zijn aan het proberen via consumenten te betrekken. Maar dat is ook voor ons een beetje afwachten en kijken wat de toekomst brengt. Daar werken we iedere dag aan maar ja. Ik kan alleen zeggen dat er momenteel 5,000 handelaars zijn aangesloten in België en dat er wel misschien 600,000-700,000 handelaars in België bestaan en dus dat we nog een lange weg moeten afleggen om op zijn minste naar de cijfers van de WIR van 50,000-60,000 handelaars te geraken.

- Hubert: Jullie hebben al een app gedeveloppeerd. Wat denken jullie om in de toekomst de blockchain technologie te gebruiken?
- Junior: Ik heb nog niet veel onderzoek aan gedaan omdat ik denk dat het iets anders is. Omdat het bij ons alles is gecentraliseerd. Dat wil zeggen dat we zijn de centrale instelling en ik denk dat het met de blockchain voornamelijk gaat met het decentraliseren. Ik kan er dus niet echt op antwoorden omdat het voor dat soort vragen, overleg ik voornamelijk met onze ICT collega's en we hebben nog niet echt ervoor gesproken? We hebben al wel een beetje bekeken maar er zijn nog niet directe plannen ervoor. Dat kan zijn dat we wel open voor staan maar we zijn er nog niet dieper op ingegaan.
- Nicolas: Offeren jullie ook lonen in RES?
- Junior: Normaal gezien de euro is wat ze noemen een "Legal tender" dat wil zeggen dat het is het wettelijk aanvaarde betaalmiddel en dat geldt ook voor de lonen. Dus die moeten in euro betaald worden tenzij dat de werknemer akkoord gaat, dat hij een stuk of gedeelte in RES wil ontvangen. Maar dat gaat nooit volledig zijn en voor ons bijvoorbeeld, de meeste mensen die bij ons werken, maar dat is uit principe, krijgen ongeveer 100 RES van een loon ontvangen. Dat gaat dus altijd heel beperkt blijven denk ik. Want elke handelaar, handelaar heeft kosten in euros te betalen en we zeggen ook altijd tegen onze handelaars dat ze het stukje in RES aannemen, altijd tussen 3%-5% van hun omzet mag bedragen. We beloven dat het tussen 3%-5% zal gaan. Daarom dat er ook sommige "spelregels" zijn ontwikkeld om die rekening onder controle te houden zodanig dat ze eigenlijk de inkomsten in RES dat die beperkt blijven zodanig dat ze die ook gaan kunnen benutten bij de andere aangesloten handelaars. En dat situeert zich

ongeveer tussen 3 of 5%. Zijn er mensen die meer doen aan 3-5%? Ja, dat kan maar dat zijn ook mensen die veel meer uitgave vermogen hebben. Maar in de praktijk, gemiddeld raden we ook altijd aan om tot 3 à 5% te houden. Wij weten ook in intern welke categoriën of welke rubrieken of type handelszaken die meer succes hebben in verkopen in RES daar gaan we eerder afremmen; en ook welke dat minder succes hebben en daar gaan we meer promotie maken of gaan we zorgen dat die meer zichtbaar zijn. Concreet, de B2C kunnen kiezen of ze 50% of 100% van het bedrag in RES ontvangen. Ze kunnen ook zeggen als ze 100% accepteren dat het maximum voor 250 RES mag zijn bijvoorbeeld. Zo kunnen de handelaars eigenlijk hier hun rekening onder controle houden. Stel dat ze toch, desondanks dat we 50% doen met een maximum bedrag, toch nog teveel RES zou ontvangen, dan kunnen ze vragen om tijdelijk onzichtbaar te staan, dat ze voorlopig geen RES aannemen tot dat het gezakt is. Ze kunnen ook hun percentage soms veranderen zolang ze het ons late weten, we veranderen op de website, zodat ze niet iedere dag gaan wisselen. Voor de B2B daar zijn de regels anders en kunnen ze het percentage zelf bepalen die ze aannemen in RES. We komen er niet tussen. Ze kunnen zeggen bijvoorbeeld: “dit kost 10,000 euro, ok je mag 3,000 RES ervan betalen”. Ze beslissen onderling. En dus hier kunnen ze heel gemakkelijk hun RES rekening onder controle houden. Dus dat zijn de manieren hoe de handelaars hun RES rekening onder controle kunnen houden. De spelregels hebben verander over de jaren maar nu voorlopig, met onze ervaring, geloven we dat het nu de beste manier is. Dat kan dat we het zullen veranderen in de toekomst.

- Nicolas: Gedragen jullie als een bank? Ik bedoel, geven jullie credit toe aan handelaars?
- Junior: We geven wel kredieten maar we moeten wel verwoorden, dat zijn “RES ruilkredieten”. Het zijn dus geen kredieten in het klassieke zin van het woord. Waarom niet? Eigenlijk gaan wij hen RES voorschieten en zij beloven dan dat zij voor dezelfde waarde goederen en diensten gaan leveren aan het netwerk binnen het termijn die wordt afgesproken. Dus ze gaan dat nooit in euros moeten terugbetalen, altijd in goederen of diensten. En dat is wel een essentieel verschil met klassieke kredieten want daar zijn ze in euros terug te betalen. Bij ons betalen ze eigenlijk hun krediet terug met de levering van goederen en diensten aan het netwerk. Er zijn twee soorten kredieten: een kaskrediet, dat wil zeggen dat ze tijdelijk negatief kunnen gaan op hun rekening. Normaal gezien, elke handelaar, met enkele uitzonderingen na, kan tot -2,000 gaan op zijn rekening. Willen zij extra? Dan kunnen ze dat door een verhoging van de kaskrediet

lijn. Dat is meestal tijdelijk, dat is op basis van offertes. Of ze kunnen een ruilkrediet aanvragen en daar wordt het behandeld door de kredietcommissie. Dat zijn drie mensen die daarover oordelen en dat is afhankelijk van de RES inkomen enerzijds en ook het type handelszaak. Er zijn maandelijkse aflossingen en een termijn bepaald aan elk ruilkrediet. Er worden ook geen interesse aangerekend. Dus ze betalen gewoon terug wat ze oorspronkelijk hebben geleend. Dat is dus het voordeel dat ze hebben, dat ze geen interesse moeten betalen. Dat gebeurt regelmatig en wordt gebruikt om versneld investeringen te kunnen betalen. Ik heb een voorbeeld hier of een restaurant in Leuven. Ze hadden al hun geld geïnvesteerd en die hadden nog een terras buiten dat ze moesten nog inrichten maar ze hadden geen euros meer ter beschikking dus hebben ze via RES geleend en hebben ze hun terras kunnen plaatsten en daardoor hebben ze onmiddellijk kunnen profiteren van de zomer en de mensen buiten te kunnen bedienen ook. Ik ga ook jullie dit boekje geven. Het is eigenlijk het club blad, het blad voor de handelaars. Wat is interessant voor jullie hier zijn de getuigenissen van de handelaars die hun redenen geven waarom ze aan RES meedoen. Jullie kunnen ook alles terugvinden op de website. Een ander zaak dat is interessant is hier waar we de handelaars uitleggen hoe efficiënt men kan betalen en kopen met RES.

- Hubert: Wat denk u van het actueel monetair en economisch systeem? Zijn complementaire munten noodzakelijk om het meer stabiel te krijgen?
- Junior: Ik vind het een moeilijke vraag in de zin dat ik geen studies daarvoor heb gedaan. Ik heb ook geen economisch achtergrond, ik ben juridisch geschoold. Maar, in algemeen, denk ik dat er daar een aantal fouten in zitten die niet per se door ons kunnen opgelost worden in die zin dat als een handelaar bij ons zelf zonder euro zit, dan is het soms ook moeilijker om met RES te werken. Ze kunnen wel gedeeltelijk zaken met RES gaan betalen maar niet altijd volledig. Bijvoorbeeld over een bedrag van 10,000 euro, enkel 3,000 kan met RES betaald worden. Dus, het is niet zo dat als de economie volledig in recessie gaat dat ineens bij ons alles zal boomen. Voor een stukje bij sommigen wel, maar eigenlijk, denk ik, het is mijn mening, er zijn wel studies die het tegengesteld zeggen, voor zaken die bijna failliet zijn, is er geen RES reddingsboei. Het is eerder voor zaken die wat extra (geld) kunnen gebruiken, kunnen we wat extra bezorgen en die op een gemakkelijke manier met RES gaan werken. Op dit moment is RES te klein om de globale economie echt groot impact te hebben. De studies kunnen gebaseerd zijn op systemen waar meer gebruikers in het systeem zijn. Dus, ik denk

inderdaad wel dat als men komt tot een systeem met meerdere gebruikers zijn in de markt, dat wel een zekere stabiliserende rol kan hebben. Met zulke systeem van complementaire munt, zorgt men wel dat het geld lokaal blijft en dus dat het niet naar het buitenland kan gaan waardoor dat er belastingen worden betaald (lokaal) en dus niet in het buitenland. Op dat vlak heeft het ook een positieve invloed op het economisch model. Maar ik denk dat als je wil grootschalig hebben, heb je meer gebruikers nodig. Dat is ook de reden dat we nog niet toenadering hebben gekregen van de politiek omdat ik denk dat we op dat vlak nog te klein zijn om een erg impact te hebben op de volledige economie. Om een idee te geven, wij doen op jaar basis, 50 miljoen RES euro transacties als je dat gaat afschetsen op de totale transacties van de totale economie in België, is dat nog veel te marginaal om eigenlijk een impact te kunnen hebben op de globale Belgische economie. Misschien in de toekomst als we nog meer groeien. Deze kleine systemen hebben dus wel een positief invloed maar misschien meer individueel toe op de handelaars dan op het globale niveau. Dat is mijn gevoel. Voila mannen.

- Hubert & Nicolas: Bedankt voor uw tijd.
- Junior: Graag gedaan.

#### A.5.2 RES prepaid card



### A.5.3 RES Information Brochure



### A.6 Interview with Professor Eduardo Diniz

(Diniz, 2017)

- Nicolas: Good afternoon Professor, thank you for your time. So, I am currently drafting my master thesis and I was wondering if you could help me with this as it is about the monetary system and complementary currencies. Alexis, a friend of mine who attends your class of Microfinance recommended me to interview you about it.
- Prof.: Yes, hello Nicolas, no problem. What would you like to know?
- Nicolas: Firstly, as I have explored during my researches that Brazil is an important actor in complementary currencies, I was wondering which complementary currency was the most important one?
- Prof.: Banco Palmas is the most important one. If you can read Portuguese, you should go to the website of Banco Palmas. There is also a book about the 15 years of Banco Palmas cowritten by Bernard Lietaer. And I am here as well.
- Nicolas: So, you have been working with Bernard Lietaer?
- Prof.: No no, I do not know him personally. I have used a lot of his work.

- Nicolas: Yes, he is pretty involved in this case no?
- Prof.: I think he is probably the most important name in this field. There are also others like Jérôme Blanc. Do you know him?
- Nicolas: No...
- Prof.: So, this is a name that you should know. Jerome Blanc is a very important name related to community currencies. He writes a lot about this. You must read what he is doing
- Nicolas: Ok. And so, when was the Palmas introduced?
- Prof.: It was in 1998, so almost 20 years now. It was the first Brazilian case of community currencies. I am not sure if it was the first one but for sure it was the first most important and has inspired many others with the same Palmas model in many different states. Most of these informations are on this website and there are always organizing meetings about the community banks. And I would say that in Brazil the most important cases are related to community banks because of Palmas. And the fact that they are related to a community bank, they are more than just a currency. So, they are kind of social organizations that also issue community currencies.
- Nicolas: Ok, so is it better that it is issued by a community bank?
- Prof.: It is not better, it is one of the models. Do you know the book from Bernard Lietaer about People Money? Do you know this book? It is accessible from the web.
- Nicolas: No I do not know it. Maybe I know it in French, there might be another title.
- Prof.: So, it is here, People Money, I think you can find it completely available on the internet.
- Nicolas: Ho this is great.
- Prof.: He wrote this book with this woman, Margrit Kennedy and John Rogers.
- Nicolas: Ok, and you never heard about the “saber”, it is a complementary currency introduced by Bernard Lietaer in Brazil.
- Prof.: No ... Ha but on the internet, they say it is a proposed currency, probably it doesn't exist.
- Nicolas: Ha ok
- Prof.: That's why I don't know about it. But I can tell you for sure that if you want to talk about community currency in Brazil, in general, Palmas is the leading model. Of course, there are others but Palmas is the leading model. So most of Brazilian

community currencies are related to Palmas' model. This is something I can say for sure.

- Nicolas: And what are the main benefits of the introduction of this money?
- Prof.: All the community banks are created in poor areas, so the main objectives are to improve the social conditions in these poor areas, especially employment and it is also related to other services than just the money like credits for example. First they have to create the community bank and then the community currency and so the credits can be granted in the national currency or the complementary currency. The main benefits are that the rate of employment improves in these regions where the complementary currency is introduced; they incentivate local production; they create something that they call map of production and consumption ... This means that they go to every house and ask: "how much do you spend for cleaning products" for example, and then they make a map of consumption and then they cross this map with what is produced inside the community. And of course, what they discovered is obvious that most of the things that are consumed inside the community is produced outside. Then it is part of the work of the community bank to investigate and change this. So, "let's think about what can be produced inside the community". For example, cleaning products, clothes, food, whatever, and then the community bank starts providing credits to micro entrepreneurs to produce those kinds of things inside the community. Then they start spending more money inside the community and this makes a lot of sense for the community currency to circulate inside the community. They create the conditions for doing so. So the currency is part of that strategy. So the main strategy of creating community banks has three parts: to issue the community currency, to provide credits and especially credits with community currency but not only with the community currency and to make the map of production and consumption. All those three things are very important. And another thing they have developed later is the partnership with the traditional financial system. I don't know if you know the idea of correspondent banking?
- Nicolas: I have never heard about that.
- Prof.: Correspondent banking is the kind of operation where retail stores for example provide bank services in the name of a bank. Like for example in Brazil you can go to any lottery shop and make deposit and ask for credits because all the lottery shops are connected to a bank and you can do the same if you go to a post office ... It is Banco do Brazil which is connected to the post office and it is caixa economica which is

connected to the lottery shops. But there are other banks like Bradesco for example is connected to many other kinds of small stores. And Caixa Economica is also connected to the community banks. So, the same way of the post offices, lottery shops ... that can offer banking services in the name of a bank, a community bank can also provide banking services in the name of a bank. Then the community bank makes a partnership with a traditional bank to offer services that they usually cannot offer like for example insurances or other kinds of investments, savings, ... and there are products that the community banks are not allowed to provide by themselves so they have to be connected to a traditional banking organization to provide these kinds of services. So, this is the fourth dimension, axis of strategy of a community bank. Actually, I have written some papers about that. If you go to google scholar and you type my name ... Usually in Brazil you use the expression “social currency”.

- Nicolas: So, in Brazil people use rather the term “social currency”?
- Prof.: Not only in Brazil, in Latin America, the expression “social currency” is more common than community currency. Community currency is more a European expression. But it is the same thing. Just because in some cases in Europe, community currencies do not always focus specifically on social things like for example the currency in Belgium you might know called “E portemonnaie”.
- Nicolas: No, I don’t know this one. It is electronic money?
- Prof.: It is a very nice one, it is an electronic community currency and it is related to a social engagement to get people saving energy. They receive compensation in e portemonnaies and then they spend this eportemonnais in other municipality services.
- Nicolas: I see that we still have to read much more on complementary currencies. The reason why I do not know that much right now is because we finished the two first chapters about money and the monetary systems and now we want to deepen our researches in the complementary currencies. That was the aim of our supervisor, to have a good background before deepening complementary currencies.
- Prof.: Your supervisor is an economist?
- Nicolas: Yes, his name is Bruno Colmant, do you know him?
- Prof.: No I don’t
- Nicolas: He is a famous economist in Belgium ... He knows Bernard Lietaer...
- Prof.: So, my field is mostly related to technology. I am more interested in digital community currencies. I have written some papers around that ...

- Nicolas: And why are you more interested in digital currencies?
- Prof.: Because of my background. So I am a former electronic engineer. I have been working in banking technologies for more than 20 years, almost 30 years now and so that is my focus of interest, the digital side. I can also tell you my perspective is that it is gonna grow much faster, the becoming digital or digital born community currencies, than all the other paper community currencies.
- Nicolas: So the paper currencies will decrease?
- Prof.: Yes, so the paper will be something like a fetish, it's nice to have these papers to show. It is not the same than to have it on an account... For example, Palmas they have this platform "edinheiro" this is a digital platform for the network of community banks.
- Nicolas: So not just for Palmas?
- Prof.: No, not only for Palmas, but Palmas manages this infrastructure. So there are many Brazilian community currencies run in this. You can also have more information on the web if you type "edinheiro"... This means "Is money" in the North of Brazil. Even on the website of Palmas you can find more information about that...
- Nicolas: And what are the tools for creating a complementary currency?
- Prof.: Actually, you can make it though many different ways ... If you go to the Palmas website, they explain how to create a community bank and then they have a spreadsheet telling how much it costs... So they say how much it costs in twelve months, and what actions they have to do like planning, equipments, ..., the map of production and consumption.
- Nicolas: So these are the different phases for the introduction
- Prof.: Yes and how much it costs for doing this in one year.
- Nicolas: And one Palmas is one (Brazilian) reals right?
- Prof.: Yes, so in the Palmas model, all the currencies are backed by Brazilian money. That's part of the model.
- Nicolas: Yes and it's part of a lot of complementary currencies right?
- Prof.: No, many complementary currencies are different. For example, you know the concept of time banking? It's like community currencies that are backed by time. So like for example, you give one hour of service and then you have credit and so you can ask other people to do some stuff for you and spending the same time for other kind of services.

- Nicolas: This is a nice concept. Because for example, if the reals loose a lot of value then the complementary currency will also lose value.
- Prof.: Yes, but you know, the thing is not really that because they do not create inflation as the circulation of the money is limited. And if they lose value, because of inflation or something like this, it does not impact because they have the main focus on employment for example, and is not that much impacted by the lost of value... It is also easier to implement this model because it is easier to show the value for the people. For example, it is 5 Palmas but it is also 5 reals. So you know how much it is worth.
- Nicolas: I know a concept of complementary currencies where the value is decreasing over time. Is it the case for Palmas?
- Prof.: No, this is demurrage. Demurrage is the system where they decrease the value of the money over time. It is implemented in the design of the currency... So for example, if you do not use the money for one month, then the money might loose 30% of its value.
- Nicolas: So, and how do you implement this? Is it only with e money?
- Prof.: No, with whatever money. It is in the design of money so in this case for example with Palmas, let's say that after one month without using this, because of demorag, the banknote of 5 Palmas won't be 5 anymore but 4. But for Banco Palmas and the community banks in Brazil they don't use this. But in many cases of community currencies, they use this system.
- Nicolas: So, it loses its value if you have it and you do not use it, but how people can know that you did not use it for a time?
- Prof.: There is some control over that. For example, when I transfer money to you, there is some mechanical information that you got this exactly on that day. Or if I give you paper money, there is some space for example on the banknote to mark the day of transfer with a signature and you have to do the same to the next one.
- Nicolas: And what do you think about this system?
- Prof.: Well, I think it's interesting but you have to have a very clear proposal for that... Because people think about money also as a thing to store value. If you have this demurragesystem, you cannot store. So it is not a good money for storing.
- Nicolas: Yes, so it is only a way to boost the economy for consumption.

- Prof.: Exactly, because with demurrage you withdraw one of the function of money which is store of value. So you need a clear proposal for that. You create the money to incentivate circulation of the money not for other purposes.
- Nicolas: So it really depends on the solution and the issue you want to tackle.
- Prof.: Exactly. It is a decision made by the group that creates the currency from the beginning ...
- Nicolas: And does the economic crisis now in Brazil have an impact on the evolution of complementary currencies in Brazil?
- Prof.: Instituto Palmas, is related to Banco Palmas and is actually the institution helping other communities to create their own community banks and community currencies. As we are in the middle of the crisis, we don't have much money to pay them to go to the places and the process of implementing new community currencies is more difficult.
- Nicolas: So it has an impact.
- Prof.: Yes, because it has a cost and someone has to pay for this.
- Nicolas: Yes and actually the community is paying for this?
- Prof.: Yes or the (city) government itself. For example in Manaus, the city of Manaus has a program to incentivate the creation of community banks in different neighborhoods. So the city government pays for instituto Palmas to go there and train people to create the community banks.
- Nicolas: And can you pay for example your taxes with Palmas?
- Prof.: I am not sure, it depends on the bank I think. But if you have an account on the community bank, and the bank works with a correspondent bank, you might convert, so not directly, your Palmas in reals and then pay your taxes.
- Nicolas: And what does the federal government think about it? What is the position of the federal about community money? Is it against it?
- Prof.: No, it is not against, not at all, they incentivate. They incentivate the Palmas model because they think that the Palmas model has better control and a better knowledge of how to do it. So they incentivate new community currencies to be created following this model.
- Nicolas: Do you think that the evolution of complementary currencies has an impact on globalization by reducing it because it incentivates local production.
- Prof.: I would say the contrary and that is the reason why I am more interested in digital community currencies: . If you have digital systems for example Palmas, so you can run

different currencies in the same system. So you could have for example a community currency that is in Belgium and has a partnership with a currency in here in Brazil and you can then make these kinds of exchanges that are not possible nowadays. But then, I think that this can be done only through digital platforms...

- Nicolas: Is the blockchain and the Bitcoin supporting the traditional monetary system?
- Prof.: No, not at all. Bitcoin was actually created to work totally in parallel with the official system. But now, it has become more and more integrated. But other cryptocurrencies are not related at all to the official system. Actually, there are some people who are trying to create community currencies based on blockchain ... Imagine to manage these currencies, which is complicated and expensive, with blockchain, you can make it more efficient and cheaper... Because it is really difficult and expensive to manage paper currency compared to digital currency...
- Nicolas: So you think that a combination of complementary currency or community currency with blockchain could improve even more the system and reduce the costs?
- Prof.: Yes, I truly believe this. I think it should be a way to evolve the community currency systems by adopting digital platforms through mobile or a decentralized platform like the blockchain. I think it is the future of the community currencies, they will be all digital in the future in my perspective. Blockchain makes it cheaper, easier and more reliable way to create complementary currencies. It is the very beginning, and a very few community currencies are based on blockchain. At this point, you cannot say if they gonna last. All of them have maximum some months of existence. You have to wait a little bit more to see if it's gonna last but I believe in the future more community currencies will be like this. Another source that could be relevant for you is D-Cent. So they do a lot of different things but one thing they do is complementary currencies. They are providing kind of technology and it is based on blockchain...
- Nicolas: And do you also share the opinion with Bernard Lietaer that these complementary currencies are absolutely necessary for the monetary system otherwise we gonna go to even more crises.
- Prof.: Yes, this part I totally agree with him.
- Nicolas: Are there some parts you do not agree with him.
- Prof.: No, in general I agree with him.
- ...

- Nicolas: One last point, do you think that Bitcoin could be a currency for you? I mean a money for you as one of the feature is quite difficult to have because it fluctuates so much
- Prof.: Yes, I am not sure that Bitcoin is a good solution as a community currency. I would suggest you this paper from Brett Scott ...
- Nicolas: Thank you a lot for your time and your availability.
- Prof.: Well even after you come back to Belgium, if you want to make contact, I would like to keep in touch with you about this because I really like students like you who embrace that idea.

### **A.7 Interview of Benoit Legrand, Head of FinTech at ING Bank**

(Legrand, 2017)

- Nicolas : « Est-ce que ING Banque participe d'une manière ou d'une autre dans les monnaies complémentaires ? »
- Benoit: “Non, nous ne faisons pas ça car si c'est juste une ville, ça apporte une complexité en plus. On ne suit pas ça »
- Nicolas : « Les monnaies complémentaires cherchent à garder la richesse dans les communautés en les empêchant qu'elles partent dans les poches d'actionnaires ou autres multinationales »
- Benoit : « L'idée n'est pas bête ... c'est bien comme système, c'est compliqué comme système et est aussi compliqué à mettre en place ... Tu ne peux aussi pas imposer ça en tant que banque, c'est la communauté qui doit proposer ça ... Une monnaie qui est gérée par une autorité particulière. Nous on a donc pas vocation à faire des monnaies comme ça ... Chez nous on recherche de la simplicité, et là c'est de la complexité qui est rajoutée ... Je pense plus qu'on peut par le biais d'une monnaie à avoir une économie plus solidaire ou plus social, c'est plus possible par l'imposition, en mettant des TVA moins importantes sur les biens qui ont été produit en local et distribués localement et ... aura peut-être plus d'impact que de faire une monnaie alternative »
- Nicolas : Selon Bernard Lietaer, les monnaies complémentaires vont stabiliser le système monétaire actuel qui est actuellement le même partout dans les différentes

grandes puissantes économies ... Avoir différents types de monnaies supportant différentes activités pourront stabiliser le système monétaire »

- Benoit : « Il y a aussi pleins de réseaux sociaux qui créent leur propre monnaie alternative, donc ça se créé »
- Nicolas : « Les monnaies complémentaires basées sur les communautés afin de booster l'économie locale et d'aider les commerçants locaux »
- Benoit : « Ces monnaies adressent plutôt des problèmes politiques et non commerciaux, et donc les personnes qui ont intérêt à faire ça ce sont les politiques et non les banques commerciales ... On ne va pas gagner plus d'argent, moins d'argent avec ça. Par contre, pour les communautés c'est malin »





