



Universiteit Leiden

BITCOIN: THE PROS AND CONS OF REGULATION

Samantha Douma  
samanthamdouma@gmail.com  
s1453297  
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# Introduction

## The Evolution of Money

Money makes the world go round. “Money is a social institution: a tool created and marked by society’s evolution, which has exhibited a great capacity to evolve and adapt to the character of the times. It is not surprising that money has been affected by recent technological developments and especially by the widespread use of the internet” (European Central Bank, 2012). There once was a time where people actually carried around gold and silver with them in order to buy goods and/or services. This type of currency had value itself; one could even make things out of this currency. Of course, carrying around gold and silver everywhere one went was not a practical way to purchase something, carrying around gold can be pretty heavy and can be easily stolen. Paper money was introduced as evidence of a promise to pay the bearer the amount of gold indicated. This resulted in, amongst others, overcoming physical problems of carrying around gold.

In the early 1800s, money was backed by gold; we called this the gold standard. Paper notes represented a certain amount of gold, and guidelines were established in order to protect inflation. The idea behind the gold standard was that people could trade in their paper money for actual gold. The gold standard ended in 1930, but was started up again after the end of the Second World War. In the 1970s, the United States ended the gold standard indefinitely. From that moment on, money became fiat money, based only on the trust in the government that issued the currency; as long as people believe money has value, then it does.

Today, paper money has been replaced by credit and debit cards. Some people do not even handle real paper money anymore. Plastic cards make every purchase easier. We can do our shopping over the internet. People can buy a product from the other side of the world and have it shipped to their house all in a matter of clicks and keystrokes. With the increased use of plastic cards, we have seen an increase in public and private debt. As a result of the receding physical dimensions of money, even governments are accumulating obscene amounts of debt.

With the financial crisis of 2008, starting in the United States, housing markets crashed and unemployment rates soared. The financial crisis trickled to Europe and, in 2011, the European Central Bank was forced to make a decision about bailout packages given to countries throughout the European Union whose banking system had failed. As a result of these bailout packages with public money, citizens began to distrust their governments and

their faith in money began to decrease. “Why trust a currency backed by a government that is fourteen trillion dollars in debt?” (Davis, 2011). Enter digital currency: Bitcoin.

### **Bitcoin: An Answer to Government-issued Currency?**

Bitcoin is a virtual currency. Created in 2009, this virtual currency was invented to circumvent government interaction. To some, the creation of a virtual currency was inevitable; it was not surprising when someone was able to create the software capable of inventing a virtual currency such as Bitcoin. When the internet was still in its infancy, “Many theorized that the advent of the Internet would cause a new kind of money to be born. Rather than carrying around paper bills or metal coins, people would instead switch to digital currency: Internet-based money stored on a computer and transferred over the World Wide Web” (Plassaras, 2013). An individual can obtain Bitcoins through purchasing them online, buying or selling goods and/or services with Bitcoin, or by mining them. Users can “mine” Bitcoins by solving complex mathematical equations; by solving an equation, a miner receives Bitcoins as a reward.

While Bitcoins can be transferred around the world in a matter of seconds, thus furthering technological efficiency in transactions worldwide, the use and existence of Bitcoins is fairly controversial at this time. Amongst other ‘threats,’ the value of Bitcoin is volatile and the currency is linked to criminal activity. Bitcoin, however, also makes transactions faster, easier, and cheaper, with absolutely no banking fees.

As stated above, Bitcoin usage is controversial. Governments (particularly governments of member states in the European Union) have taken different stances towards Bitcoin usage. For instance, in Germany, Bitcoin is considered private money or a unit of account while in France, Bitcoins cannot even be considered a currency under French law. Some countries want more regulation (i.e. France), while others have not come to any such conclusion. The national treatment of Bitcoin is not yet substantiated by any literature on the merits of regulation.

Discussions have taken place about Bitcoin at the European Union level, but that is as far as the topic has gone. The European Central Bank has discussed ways in which Bitcoins could possibly be categorized in already existing legislature. For instance: the Electronic Money Directive 2009/110/EC, which harmonizes payment methods; another possibility would be the Payment Services Directive 2007/64/EC, which establishes rules on payment transactions for electronic money; and finally, the European Parliament Directive 2000/46/EC, which regulates electronic money. I will go into more detail about each of these

Directives in Chapter 6 as I discuss the European Union's policies towards Bitcoin usage in depth. However, the European Court of Justice has ruled Bitcoins should be considered a means of payment, otherwise indicating that exchanging traditional currency for Bitcoins online would be exempt from value-added tax under the European Union's Directive relieving currency transactions from value-added tax. The European Court of Justice stated, "Those transactions are exempt from value-added tax under the provision concerning transactions relating to 'currency, bank notes and coins used as legal tender'."

While governments have not taken any substantial steps towards regulation, consumers and producers are facing risks. Some of the potential risks to consumers and producers include criminal activities and volatility in Bitcoin valuation. Governments face potential risks as well in the form of economic threats.

As of right now, the Bitcoin is too new and volatile to know if it can rival traditional currencies. However, just because Bitcoin is young, does not mean that it will not amount to anything. Right now, governments are not taking Bitcoin too seriously, but that could come back to bite them in the end. "It took the euro years to get in the disastrous state it is in right now. We are in year four of Bitcoin" (Westwood, 2013). Given additional time and regulation by the European Union, Bitcoin has the potential to become the most valuable international currency.

Research (discussed later in Chapter 5) furthermore has indicated that the European Union will be forced to either regulate Bitcoin or ban the currency altogether, because, without regulation, it could rival the euro and further devastate the European economy.

### **Research Questions**

From the above treatment of Bitcoin and in academic literature it becomes clear that member states have developed their own policies, regulations, and different methods of taxation towards the Bitcoin system, which differ from country to country and causes confusion and legal issues. A second motivation for my research is that Bitcoin is extremely intriguing and new; the European Union would be among the first jurisdiction to regulate the virtual currency and harness countries and users against the threats it poses, while endorsing the many opportunities.

For instance, through regulation of the currency, the European Union has a great opportunity to validate something that could facilitate world trade. The Bitcoin system allows transactions from any part of the world in a matter of seconds. Regulating Bitcoin could allow poor countries in Africa to trade more easily. Bill Gates said, "Digital money has low

transaction costs, which is great for the poor because they need to do financial transactions with small amounts of money. Over the next five years, I think digital money will catch on in India and parts of Africa and help the poorest a lot” (D’Onfro, 2014).

Following these uncertainties and opportunities, the following research questions have been developed: to what extent should the European Union impose regulation on the usage of Bitcoin in order to protect users (i.e. consumers, producers, governments) from its perils and enhance the opportunities this new currency poses? This question will be answered through a series of sub-questions. First, what monetary theories frame the usage of Bitcoin? Second, according to European Central Bank standards, should Bitcoin be considered a viable currency? Third, what are the advantages versus disadvantages to using Bitcoin as a currency? And finally, by analyzing the regulatory options the European Union has at its disposition, evaluate the merits and possible consequences of those options.

This thesis contributes to the academic community in hopes to open up more debate by bringing to attention what the issues are concerning Bitcoin usage. By examining the case studies that are available, we can learn from previous mistakes and build upon other’s successes. This thesis will also examine advantages and disadvantages of the use of Bitcoin with the current legislation throughout the European Union. In so doing, if a case can be made about an unregulated infantile currency and its damaging effects on the economy, then we can hopefully prevent financial ruin. Regulation would minimize the risks of an unstable currency, but still facilitate the potential benefits down the road. Based on the literature available, it is my opinion that this would contribute to the academic debate.

### **Methodology and Restrictions**

The methodology of this thesis is qualitative. However, the existing legislation portion of this thesis does evaluate case-studies from a number of member states, which allows for the evaluation of existing practices of current regulation; this means we can learn from past failures and improve upon achievements from other examples. The objective of this thesis is to look at possible futures for Bitcoin usage in Europe through possible interventions by European Union authorities in the form of regulation. In this way, my thesis has both academic and practical relevance. By gathering facts from multiple sources (source triangulation), I will argue for the outcome of different forms of policies regarding the use of Bitcoins in Europe and will draw a viable conclusion.

This thesis consults original reports published by the European Central Bank, the United States Congress, the European Banking Authority, and the International Monetary

Fund. However, secondary sources such as articles written by news organizations and journalists have often been consulted as well.

A first hand source in gaining knowledge about mining virtual currencies and the benefits associated with a virtual currency is constituted by living with my cousin, who is currently mining several virtual currencies with no intention of stopping any time soon. He is always saying, “I am making money while I am sleeping; I do not have to do anything. What can be better than that?”

The monetary theories I have selected to conceptualize the use of Bitcoin as a currency include the Misesian Regression Theorem, which postulates that, “The subjective value of money must be measured by the marginal utility of the goods for which the money can be exchanged” (Mises 1953, 109). Secondly, the Austrian School of Economics theory of money is elaborated on, which postulates, “What is valuable for you may not be valuable for your neighbor” (Singh, 2014). Both these theories help to frame the usage of Bitcoin. The theories also help to explain how value becomes associated with currencies as a medium of exchange, which is useful to know for value placed on Bitcoins.

According to the European Central Bank, Bitcoins are not a big enough threat to consider regulating, but this thesis argues that Bitcoins, while still infantile, are still a threat to the European Union and its member states’ economies; Bitcoin must be regulated now in order to prevent financial disaster in the future. I also argue that the European Union will need to make one overarching policy on Bitcoin, because many member states have their own policies, each differing from the other. The European Union will need to unify these policies to prohibit confusion among the member states. Both consumers and producers will appreciate a firm, unified decision made by the European Union as quickly as possible.

## Chapter 1: Monetary Theories

Before I go into the main topic of my thesis, I would like to explain a few monetary theories and how they relate to Bitcoin. There are two economic monetary theories that I will analyze and compare with the use of Bitcoin in our society. The first theory I will discuss is the Austrian School of Economics Theory of Money and the Second is the Misesian Regression Theorem. The Austrian School of Economics is one of the most renowned schools in the world, known for Carl Menger's economic theory of the value of a product, underlined by the consumer's utility for that product. The Misesian Regression Theorem simply states that money is used not because governments tell us to use it, but because it represents a certain purchasing power. These monetary theories are important to include in this thesis because they demarcate the function and essence of currencies, these theories will help to answer the first and second sub-questions in my research question.

### Austrian School of Economics

The rationale behind Bitcoin can be found in a criticism by the Austrian School of Economics on our current fiat monetary system. This system allows for governments (and other agencies such as central banks) to interfere with prices, which can cause disruption to businesses and create immense inflation. "Bitcoin traces its theoretical roots to the Austrian school of economics, which holds that the current monetary system and actions of central banks exacerbate business cycles and spur inflation" (Browdie, 2012). From this, we can see that the power a government has over its currency can sometimes be unwanted, especially if it affects the currency in a negative way.

From the Austrian School of Economics, two theories have sprung that are used in this chapter to demonstrate how Bitcoin can be appreciated as a (better) alternative to our current fiat system. The first theory is the business cycle theory introduced by Friedrich A. Hayek. For the term business cycle, I will use the (monetary) definition of the European Central Bank: "Business cycles are the inevitable consequence of monetary interventions in the market, whereby an excessive expansion of bank credit causes an increase in the supply of money through the money creation process in a fractional-reserve banking system, which in turn leads to artificially low interest rates" (European Central Bank, 2012). Following these low interest rates, businesses then go on to invest in ventures that do not necessarily correspond to consumers' interests. This in turn can lead to a recession. Hayek continues to suggest that going back on the gold standard would help solve these issues immensely, because the value of gold cannot be manipulated by a central authority.

The second theoretical premise was also put forward by Friedrich A. Hayek. It is about the denationalization of money. According to Hayek (1976), denationalizing money would mean that governments would not have a monopoly on money. Currencies should be exposed to competition and traded at variable exchange rates. Those currencies that show a stable purchasing power would eradicate the less stable currencies in the market. Competition and profit maximization would create a system where the most stable currencies would coincide, making the monetary system extremely efficient. I will discuss this idea later in Chapter 5.

These two premises show how government and central bank intervention can cause damage to a monetary system; a currency without a central authority is a viable alternative to fiat money issued by such an authority. The creation of Bitcoin allows for these two ideas to take effect. Bitcoin would end the monopoly that central banks have on issuing money. Bitcoin would thereby stop the current monetary system we have now, where central banks can distort interest rates and cause recessions. Last, but not least, Bitcoin is similar to the gold standard, where governments or central banks cannot interfere with prices.

### **Misean Regression Theorem**

The second monetary theory that sheds light on the function and acceptance of Bitcoins is the Misean Regression Theorem. This theorem explains that money is valuable because it expresses a certain purchasing power, not because a government endorses it or by some other social convention.

The Bitcoin system does not fit with the Misean Regression Theorem. This theorem does not support the use of Bitcoins, because there is not a root system in a commodity that expresses a certain purchasing power. The value of a Bitcoin is determined by its demand. This is why the value of Bitcoin fluctuates so drastically.

Austrian economists have concerns about the use of Bitcoin even though the theoretical background of Bitcoin can be explained by the Austrian School of Economics. Two general criticisms of the currency include: first, unlike gold, Bitcoins have no inherent value; rather they are just a series of numbers and bits stored on a computer; and second, Bitcoin does not fit with the ‘Misean Regression Theorem’, explaining that money is valuable because it has roots in a commodity which expresses a certain purchasing power, not because a government endorses it or by some other social convention. Bitcoin does not have its roots in any such commodity.

## Menger's Principles of Economics

This next section will explain how the Theory of Money posed by Carl Menger relates to Bitcoin usage. This theory defines the essence of a currency and how Bitcoin would improve if the premise was accepted. Basically, a currency does not need to be sanctioned by the state, however, if a state sanctions money, it would harmonize transactions going forward. This poses an interesting idea: if Bitcoin were to be sanctioned by the state, Bitcoin would benefit immensely, thus harmonizing transactions conducted using Bitcoin.

Carl Menger's Principles of Economics says, "Perfect knowledge never exists, therefore all economic activity implies risk; it is the role of the entrepreneur to take upon himself those risks based on information available" (Menger, 1976). Even then, Menger saw the risk of economic uncertainty; producers could not rely on demand to determine supply and prices alone.

In the Principles of Economics, specifically his Theory of Money, Menger explains how money can develop without the interference of individuals within an economy. According to Menger, the origin of money is natural and displays legislative influence only very rarely. Because of its natural origin, money is not the product of a legislative act. Money does not need to be sanctioned by a political authority. Contrary to these ideas about the nature of money, Menger also states that if money is sanctioned by the state, then the result would be that all other transactions would have to be made using that currency, thus harmonizing the use of money. Thus the sanctioning of the state's attributes to money is a universal (nationwide) use as a substitute in exchange. Thus, although the state is not responsible for the existence of the money-character of the good, it is responsible for a significant improvement of the state, but that the state is responsible for harmonizing how goods will be paid for. Therefore, it is necessary to have a currency that is backed by the state.

The relation with Bitcoin is evident. Menger's Theory of Money relies on three axioms: first, money is not an invention of the state. Bitcoin is not an invention of the state either, so Bitcoin fits with the first part. Second: money is not the product of a legislative act. Bitcoin is definitely not a product of a legislative act, so Bitcoin fits with the second part as well. Third: money does not need to be backed by the state, but would benefit greatly if it were to be backed by the state, harmonizing its use. Bitcoin is not backed by the state. If considered currency, Bitcoin could benefit immensely. According to Menger's Principles, Bitcoin could be considered currency. If the state would sanction Bitcoin, it could become a better currency than the ones that currently exist.

The next section of my paper will analyze whether Bitcoin should be considered a currency according to the standards of the European Central Bank. The definition of a currency as it relates to Bitcoin is important to discuss, because if Bitcoin is not even considered a currency by a central bank, then there would be little motivation to regulate.

### **1.1 Bitcoins as a Currency**

This section will explain what factors determine the acceptance of Bitcoins as a currency. First of all, it is, amongst other factors, the decision of each jurisdiction whether they consider Bitcoins to be a currency. Therefore, this section will look at statements of different monetary authorities. I have found statements from the European Central Bank, the International Monetary Fund, and the Internal Revenue Services of the United States. Each of these institutions provides a definition of what they consider currency and a statement whether Bitcoins fit within their definition or not.

The European Central Bank states that a currency performs three functions: “first is a medium of exchange: money is used as an intermediary in trade to avoid the inconveniences of a barter system; second is the unit of account: money acts as a standard numerical unit for the measurement of value and costs of goods, services, assets and liabilities; and third is a store of value: money can be saved and retrieved in the future” (European Central Bank, 2012). The European Central Bank then goes on to say, “Money is a social institution: a tool created and marked by society’s evolution, which has exhibited a great capacity to evolve and adapt to the character of the times. It is not surprising that money has been affected by recent technological developments and especially by the widespread use of the internet” (European Central Bank, 2012).

The European Central Bank classifies Bitcoin as a virtual currency scheme. This means that the currency is created and controlled by the developers of the virtual currency, but only accepted by specific vendors. The European Central Bank says that Bitcoin cannot be considered a real currency, because it only fits two of the three criteria for a traditional currency. “In essence, virtual currencies act as a medium of exchange and as a unit of account within a particular virtual community. The question then arises as to whether they also fulfil the ‘store of value’ function in terms of being reliable and safe, or whether they pose a risk not only for their users but also the wider economy” (European Central Bank, 2012).

Even though the European Central Bank does not consider Bitcoin a currency, the bank still insists that it is responsible for the effects of Bitcoin usage. “Virtual currency schemes do indeed fall within central banks’ responsibility as a result of characteristics

shared with payment systems, which give rise to the need for at least an examination of developments and the provision of an initial assessment” (European Central Bank, 2012). In accordance with the European Central Bank, the European Banking Authority states, “the usage of the term ‘currency’ is misleading for several reasons, including the insinuation that it is therefore exchangeable against other currencies, which may not necessarily be the case” (European Banking Authority, 2014). From this we learn, that the European Central Bank holds central banks responsible for transactions conducted using Bitcoins (to protect users), it is therefore important to examine Bitcoin and its developments.

The International Monetary Fund also classifies money as performing three functions: “Store of value, which means people can save it and use it later, smoothing their purchases over time; Unit of account, provide a common base for prices; or Medium of exchange, something that people can use to buy and sell from one another” (Asmundson and Oner, 2012). However, the International Monetary Fund does not consider Bitcoin as a medium of exchange, because Bitcoins are not widely accepted. “Not all electronic payments involve electronic money. For instance, credit cards or debit cards are not electronic money because no monetary value is stored on them; and store cards or internet-based currency (such as Bitcoins or gaming money) are not electronic money because these are not widely accepted as a medium of exchange” (International Monetary Fund, 2013).

The Internal Revenue Services uses the definition of currency put forth from FinCEN, which states, “the coin and paper money of the United States or of any other country that [i] is designated as legal tender and that [ii] circulates and [iii] is customarily used and accepted as a medium of exchange in the country of issuance” (FinCEN, 2013). However, according to the Internal Revenue Services of the United States, Bitcoin is property, not currency. “For federal tax purposes, virtual currency is treated as property. General tax principles applicable to property transactions apply to transactions using virtual currency” (Aqui, 2014).

## Conclusion

The goal of this chapter was to elaborate on theories that explain the function and essence of money. Furthermore, this chapter delved into definitions of currencies as they are found in legislative banking authorities and taxation services. To inform the reader, I will continue my thesis using the definition put forth by the European Central Bank, which classifies Bitcoins as a type of virtual “currency”, the term currency is used lightly. For this thesis, it is the most accurate definition to use until jurisdictions amend their definitions of a currency to include virtual currencies, which are used daily as a means to purchase goods and/or services.

## Chapter 2: Bitcoins, What They Are and How They Work

What is a Bitcoin and how will Bitcoin change the way we do business around the world? Knowing the history of Bitcoin and how the currency works will help to understand how and to what extent Bitcoins will be essential to future financial progression. By the end of this and the coming chapters, the reader will understand the advantages and limitations of using a virtual currency.

For the purposes of this chapter, the definition of the European Central Bank of virtual currencies will be used: “A virtual currency is a type of unregulated, digital money, which is issued and usually controlled by its developers, and used and accepted among the members of a specific virtual community” (European Central Bank, 2012). The European Central Bank further specifies what virtual currencies are. It recognizes three types of virtual currency models, but I am most interested in what is referred to by the European Central Bank as Type Three virtual currencies. “Type Three virtual currencies have bidirectional flows, meaning that two exchange rates (buy and sell) exist, and they can be used to buy virtual goods and services, but also to purchase real goods and services.”

Bitcoin was introduced in 2009, and created by a pseudonymous developer, Satoshi Nakamoto. Bitcoin uses open source software, which means that only the developer has the rights to make changes to the system (bitcoin.com). Bitcoin is a type of crypto-currency, which basically means that Bitcoin uses principles of cryptography to keep it secure. Cryptographers construct and develop protocols using mathematical equations that help to keep information and data confidential.

Bitcoins have a peer-to-peer payment system, peer-to-peer meaning that peers work together to make their networks available to one another without the need of a centralized server (bitcoin.org). A peer-to-peer payment system means that one person can transfer Bitcoins to another person without the interference of a bank. Technically, a Bitcoin is a series of hashtags combined with zeroes and ones, which are encrypted and stored on a hard drive of a computer or mobile device. “It may be best to think of its units being virtual tokens rather than physical coins or notes” (BBC, 2014).

Only twenty-one million Bitcoins can ever be in existence. This number was set up in the Bitcoin protocol (bitcoin.org). This Bitcoin protocol uses block chain transactions which controls and limits the ability of the user to double spend their Bitcoins. Specifically, block chain is a database that keeps track of ownership and any transactions (bitcoin.org). That being said, after a few years have passed, the number of Bitcoins to be rewarded will be cut

in half. This means that the inflation rate of a Bitcoin can be controlled making the Bitcoin more desirable to users. It also ensures that Bitcoins will be around for a very long time.

According to the Bitcoin network, the protocol has been designed that develops the currency at a predictable rate. As time goes on, the mathematical equations to be solved become more difficult (more computing resources are needed). The Bitcoin website explains that the rate of creation will remain constant: six per hour (one every ten minutes). Despite this, the creation of newly generated Bitcoins will decrease geometrically over time, meaning a fifty percent reduction every four years. This means that the maximum number of Bitcoins in existence (twenty-one million) will not be reached for quite some time (2140, according to bitcoin.org).

Bitcoins can either be mined or someone can buy, trade, or exchange goods and/or services for the currency. A miner receives Bitcoins for “free” (except for electricity) by solving difficult blocks of mathematical equations (bitcoin.com). One miner competes against other miners to finish the block of equations first; the first one to finish receives the reward (Bitcoins). Anyone can mine Bitcoins as long as they have a basic knowledge of computers and understand the fundamental principles of how the Bitcoin software works.

In order to mine, a person needs a computer that has an internet connection at all times with an operating system such as Windows, Ubuntu, or Linux and a special type of graphics card, Advance Micro Device (AMD). The miner will also need the CGMiner program or GUIMiner is also reputable (bitcoinmining.com). These mining programs do three things: one, they keep your system running (controls temperatures, fan speeds, temperature cutoffs, and temperature targets; basically anything that your graphic card controls) second, they keep a connection between your computer and the system that is giving the block of mathematical equations, and the third thing is that they keep track of your blocks of solved equations and the rewards that one receives. Each miner sets up a username (worker name) and a worker ID (password) within one of these mining programs.

It is easier to mine in pools, which basically consist of other miners who “pool” (I described this type of teamwork earlier as peer-to-peer) their computer power in order to solve the blocks of equations quicker. If you join a pool, the equations you are given to solve will be smaller and easier while the combined efforts of the other miners means that the blocks are solved quicker, which means you can earn more Bitcoins. It also means that the rewards earned have to be split among the other members of the pool, but this will ultimately be worth it, because miners will be consistent in solving the blocks meaning one is more likely to receive a good reward.

You may be wondering what someone can do with Bitcoins once they obtain the elusive currency. Owners of Bitcoins can hold on to them, or they can trade them in to online exchanges, who will exchange them for other currencies. “Owners of Bitcoin can use various websites to trade them for physical currencies, such as United States dollars or euros, or can exchange them for goods and services from a number of vendors” (Britannica Educational Publishing, 2013). “Bitcoins are used to order goods online, for real world services, and, for those so inclined, illegal drugs and weapons from the Internet’s underbelly” (Mont, 2013).

In order to begin mining, a miner must download a digital wallet and create an account (bitcoinmining.com). “Bitcoin accounts are listed simply as a string of letters and numbers with no names attached, giving a level of anonymity impossible with debit and credit cards or even PayPal accounts” (Westwood, 2013). This digital wallet allows a miner to make electronic transactions. Digital wallets keep a miner’s Bitcoins more secure, it would be too risky for a miner to store his Bitcoins on his hard drive. By mining Bitcoins, a person puts a lot of stress on his computer, so, if they store their Bitcoins on the hard drive and the computer happens to crash, they have lost all of their Bitcoins and their hard work was for nothing. Digital wallets also keep Bitcoins safer from potential hackers.

Some of the most attractive features of Bitcoin are, one, the anonymity the currency can provide and, two, Bitcoin is independent of any banking authority. Block chain helps to keep the currency anonymous, but only to a certain degree. Block chain keeps track of all transactions made, but the record is made only of the receiver’s addresses; however, individual’s names remain a secret. The addresses are like privately run bank accounts, only keeping track of transactions made and stipulate that if the data is lost, so are all the Bitcoins mined or stored. “Bitcoin, in other words, survives because of what you can see and what you cannot. Users are hidden, but transactions are exposed. The code is visible to all, but its origins are mysterious. The currency is both real and elusive--just like its founder” (Davis, 2011).

There are speculators out there that believe Bitcoin is a type of Ponzi scheme, but that is not the case because the Bitcoin system does not promise a high reward to any one person. Bitcoin is decentralized and there is not one person who has control of the currency, meaning the system cannot be undermined and the funds disappear. Bitcoin does not have a type of intermediation, which means the users can buy or sell the currency without interference. There are not more benefits for one user and not another, except for maybe those who benefit from an increase in exchange rates (which would happen with any type of currency) or those

who dedicate more time and computing power to mining and, in turn, receive more rewards (Bitcoins.)

The fact that Bitcoin is independent of any banking authority means that there is not a government behind it interfering with it causing inflation and the banking industry cannot control it either; the value of a Bitcoin is determined through its desirability. “Gavin Andersen, Bitcoin Foundation’s chief scientist, says Bitcoin still remains an experiment.” Bitcoin may still be considered an experiment, but the possibilities of this experiment are extremely stimulating.

## Chapter 3: Bitcoin – The Advantages

With an understanding of Bitcoins and how they work, this chapter will discuss the advantages to using Bitcoins. It is important to know what the advantages and disadvantages are to using a virtual currency in order to explain why regulation would be necessary.

Virtual currency is more efficient than hard cash. According to Plassaras (2013), scholars state that digital money can perform functions of currency more efficiently than traditional fiat currencies (government-backed). There are three functions a currency serves: first, it acts as a medium of exchange; second, it acts as a unit of account and expresses a certain purchasing power; and third, it acts as a store of value for future spending. Bitcoin has the potential to perform these roles more efficiently than physical money.

Reasons to use Bitcoin have been described by supporters of digital currencies: first, it has an anonymous peer-to-peer payment system; second, to avoid reliance on a third party such as a government central bank or any commercial bank; third, cryptography replaces trust; fourth, to avoid inflation or collapse of a currency altogether; and fifth, to circumvent transaction costs incurred by credit card companies and bank fees.

### Inflation

Inflation occurs when the price levels of goods and/or services increase. Inflation is calculated yearly based on percentage increases. When price levels rise, the percentage of one's money buys a smaller portion of a good or service, otherwise known as, inflation. The value of money can fluctuate during this period of inflation. Inflation in an unregulated currency is virtually impossible. With a traditional currency, a centralized governing authority (such as a central bank) has complete control over the rates at which the currency is issued. "Bitcoin, according to its creators and supporters, should overcome the limitations of traditional currencies (such as inflation) that result from the monopolistic supply and management by central banks" (European Central Bank, 2012).

A rate of a traditional currency should match that of the growth of the amount of goods that are being exchanged within the country in order to maintain stable prices. With Bitcoin, there is no central governing authority controlling the rates that are issued with the crypto-currency. "However, like all currencies Bitcoin's value is still determined by how much people are willing to exchange it for" (BBC, 2014).

Bitcoin is created through its peer-to-peer network and the Bitcoin protocol has defined, in advance, how the currency can be created, the rates at which the currency will be issued, and the amount of Bitcoin that will ever be in existence (controlled supply). There are

over twelve million Bitcoins in existence today, and there will only ever be twenty-one million Bitcoins in existence (as I stated earlier), so inflation will always be kept in check.

### **No Regulating Authority**

Having no regulating authority can be considered an advantage to using Bitcoin, because recent financial crises have led people to become increasingly mistrustful of their government and the central banks within their country. Governments have become untrustworthy due to policies and special interests, which has forced people to find alternative ways to get money and circumvent government intervention and regulation; people need to be able to trust their central bank, which is difficult now with the current financial situation, as Sassower (2013) explains, “While national currencies, and more problematically the euro, rely on government policies to protect and bolster (or deflate) their value when economic conditions warrant such activity,” (Sassower, 2013). “Electronic currencies, on the other hand, would answer to market forces, rather than the policies of national governments and the various special interests they represent” (Plassaras, 2013).

By 2012, the financial crisis had affected many countries around the world. One European Union member state that had a difficult time recovering from the financial crisis was the Republic of Cyprus. The banks in Cyprus had overextended themselves too far and the Cypriot government bond credit rating had been downgraded. Cyprus’ financial sector needed to be restructured but, in order for that to be done, Cyprus would need help from the European Union. In March 2013, the European Union announced it would bailout Cyprus with an amount of ten billion euros and, in return, Cyprus would have to shut down its second largest national bank, the Cyprus Popular Bank.

In order to shut down the Cyprus Popular Bank, a one-time bank deposit levy was to be imposed on all bank accounts; protocols were put into place to ensure that no one could withdraw or transfer their money from the bank during the time of the levy. This deposit levy would have made up to four point two billion euros of which Cyprus was supposed to pay back to the European Union. However, Bitcoin exchanges allowed people to change their money and get it out of the bank, so Cyprus never made the four point two billion euros it was supposed to make to pay back the European Central Bank.

The European Central Bank had predicted a rise in the use of digital currencies; however, it probably never expected anything like this to happen. “A 2012 study from the European Central Bank suggests that the use of digital currencies like Bitcoin is only expected to grow in the near future. Recent financial crises in both Spain and Cyprus have

caused Bitcoin prices to spike as worried citizens exchange their government-backed euros for Bitcoins” (Plassaras, 2013).

According to David Mint, this run to Bitcoin spurred what is now considered the European Union’s gift to Satoshi. “If it were not for Satoshi’s creation of the Bitcoin, those lucky few Cypriots would not have been allowed to evade the government’s European Union mandated currency grab” (Mint, 2013). The Cypriot financial institutions were no longer trustworthy and Cypriots needed a way to make money without government regulation; Bitcoin was the solution to the Cypriots problems. “With exchange sites, such as Mt. Gox, there is a genuine goal of providing alternative modes of money exchange, displacing the hegemony of government-issued notes and securities” (Sassower, 2013). The value of Bitcoin soared after this government fiasco.

Other countries around the world that have strict capital controls and high inflation have seen a rise in Bitcoin usage as well. “Bitcoin points the way to a global currency that cannot be manipulated by individuals or governments. Something that powerful will either be crushed by powerful interests or become unstoppable” (Faktor, 2011). Worried citizens see Bitcoin as a way around using government backed currencies; nothing can stop Bitcoin. “‘This is the revolutionary currency of the future,’ says Joseph David, the CEO and founder of VirtEx, ‘decentralized, not controlled by any government, and no one can shut it down or freeze accounts’” (Westwood, 2013).

### **Speed and Cost**

Digital currency can transcend national boundaries, making free movement of capital easier. “As digital currency gains momentum, it will unleash a new wave of global productivity and innovation. Primarily, this will be made possible by ‘frictionless’ transacting opportunities and free flow of capital without regard to national borders or national taxation schemes” (Chahal, 2012).

“In a world that is increasingly focused on integrating technology into our lives, accustoming users to software-based finance could create long-lasting and valuable effects” (Plassaras, 2013). A financial transaction using Bitcoin is faster than any traditional transaction available today and cheaper as well. Sending wire transfers around the world using traditional currency takes several days for the payment to be received and the payer will end up paying a small percentage in transaction fees. A person can transfer Bitcoin around the world in a matter of seconds with no transaction fees or any other incurred costs. “For the first time in history, technology makes it possible to transfer property rights (such as

shares, certificates, digital money, etc.) fast, transparent and very secure” (Duivestein and Savalle).

Another positive effect of using Bitcoin is that a person can use them anywhere in the world without having to exchange currencies (i.e. dollar to euro) and without transaction fees. “Digital currencies can avoid these costs because they are designed to be used transnationally via the Internet. Digital currencies are ‘universal’ in that they can operate outside a system that uses multiple currencies, thereby avoiding the transaction costs associated with currency exchange” (Plassaras, 2013).

As long as there are places that accept Bitcoin in the country a user is visiting, then they can pay with their virtual currency, which means that there will not be a banking fee or an ATM fee. “If a buyer and seller are running the software on their computers, they can directly exchange Bitcoins, anonymously and with no taxes or bank fees” (Westwood, 2013). This would not be possible with traditional currencies; a person would be required to exchange currencies when they enter a foreign country and bank fees and/or ATM fees would be associated with that.

Some users associate using Bitcoin for transactions as similar to using a PayPal account. “Bitcoin seems very safe and is quite similar to using PayPal which a lot of people use for eBay and other things on the internet so I am not so concerned about the security” (Dassanayake, 2014). PayPal is accepted everywhere around the world, but when you buy something that is sold in another currency, there are fees associated with it. Therefore, Bitcoin is better than PayPal, skipping the fees. Bitcoin is transferred anonymously, with no ties to users, so that makes paying for goods safer than using PayPal; there is not any personal information to steal. “We believe Bitcoin can become a major means of payment for e-commerce and may emerge as a serious competitor to traditional money-transfer providers. As a medium of exchange, Bitcoin has clear potential for growth and that in a long-term fair-value analysis maximum market capitalization for Bitcoins could be fifteen billion dollars” (Hill, 2013).

Bitcoin could also be the force that changes the way our society uses money altogether, making cash obsolete. Cashless societies could become the norm but much will depend on consumer confidence in the available options and the level of security. Marion King, President of MasterCard UK and Ireland said, ‘There are different levels of take-up across the globe but I think that cash will increasingly be replaced, largely because of technological innovations and digital currencies via the smartphone. This will be a long-term shift but we are definitely heading in that direction.’” (Chahal, 2012).

Credit and debit cards have started the move towards a cashless society but Bitcoins could ultimately phase fiat currency out altogether. “Virtual currency is one of the steps towards a cashless society and it is part of an ecosystem emerging not just around payments but how we value activity. There is a practical level about monetary exchange and a higher level, conceptually, around what we use as markers for value in the economy” (Chahal, 2012). As consumer confidence in virtual currencies increases, the amount of transactions using Bitcoins will increase as well. “The future of payments and the move towards a cashless society will come down to consumer confidence in these digital forms and currencies, the level of trust and ease of use” (Chahal, 2012).

## **Conclusion**

The advantages to Bitcoin discussed in this chapter would be enhanced with regulation. With regulation, inflation from a central bank would remain virtually nonexistent and transaction costs would remain low. However, having a regulating authority would need to be changed, but this will ultimately be beneficial to consumers, producers, and governments, because it will protect users from possible dangers and enhance the opportunities the currency presents (as the reader will learn in Chapter 5.) Now that the possible advantages to Bitcoin usage have been discussed, the next chapter will go into more depth about the disadvantages to using Bitcoins.

## Chapter 4: Bitcoin – The Disadvantages

After having understood the advantages of the use of Bitcoins, this chapter will have a look at the disadvantages that are recognized in literature. Naturally, there are negative aspects when using a virtual currency. As we will see, Bitcoins can be considered a bad alternative to traditional money, because virtual currencies promote criminal activity such as: money laundering, drug trafficking, double payments, computer hacking and terrorism. However, none of these activities is endemic to the use of Bitcoins.

There are other negative aspects to using a virtual currency that do not have to do with criminality such as speculative investment, unpredictability, and irreplaceability of Bitcoins. Finally, there is a lack of places to use or spend Bitcoins. Bitcoin users bear all the risks.

### 4.1 Criminal Activities

Virtual currencies encourage illegal activity, because people are able to hide their money from the government.

#### Money Laundering

Money laundering refers to the way criminals “clean” and try to hide the original source of their money. When a criminal uses Bitcoins to proliferate his illegal activities, he is able to route the transfers of the digital money to hide where the original source came from or the destination of where that money is going, thereby concealing his or her crime organizations. Money laundering can be linked to tax evasion and even evasion of international sanctions.

#### Drug Trafficking

Drug trafficking can also be linked with money laundering, but I made this a specific negative category to Bitcoin because of the historic Silk Road marketplace incidents in the United States. Silk Road was an online marketplace where the sale of illegal drugs took place (also known as the amazon.com of illegal drugs). The Silk Road marketplace had a limited amount of user accounts available, where users could buy drugs using only Bitcoins. Users came from all around the world; some of the top users came from Germany and the Netherlands.

The leader of Silk Road was arrested in 2013, for drug trafficking and money laundering, murder for hire, and for charges of computer hacking. The United States Federal Bureau of Investigation seized over one hundred and forty-four thousand Bitcoins, which is estimated to be about twenty-eight million dollars. It is estimated that the amount of revenue

Silk Road generated from sales was nine and a half million Bitcoins or one point two billion dollars.

### Double Payments

In late February 2014, the largest Bitcoin exchange network, Mt. Gox (Magic: The Gathering Online Exchange), experienced a major glitch in its system and suspended all Bitcoin withdrawals (transactions from a Mt. Gox digital wallet to a third party). It was discovered that Bitcoin users could alter the transaction process into sending twice the correct amount of Bitcoins to their digital wallets. “A bug in the Bitcoin software makes it possible for someone to use the Bitcoin network to alter transaction details to make it seem like a sending of Bitcoins to a Bitcoin wallet did not occur when in fact it did occur. Since the transaction appears as if it has not proceeded correctly, the Bitcoins may be resent” (MtGox, 2014). This essentially meant that Bitcoin users could receive double the payments of Bitcoins they should have been receiving.

Receiving double the payments of Bitcoins was fairly easy to do using a DoS attack. A DoS (denial of service) attack basically means that hackers flood a targeted server with so much traffic or requests that a server cannot respond to real traffic; the server responding time becomes so slow that it becomes useless and unavailable; when a server is targeted, it can no longer perform its intended services. Mt. Gox experienced a DoS attack, where hackers exploited the “transaction malleability” by sending copious amounts of transactions rendering the exchange servers completely useless and thereby allowing the hackers to alter their Bitcoin codes and receive double the payments for their transactions. (Wolf and Flitter, 2014)

Mt. Gox assured Bitcoin users that the exchange would be up and running when the glitch was fixed, further stating, “Bitcoin transactions are subject to a design issue that has been largely ignored, while known to at least a part of the Bitcoin core developers and mentioned on the BitcoinTalk forums. This defect, known as ‘transaction malleability’ makes it possible for a third party to alter the hash of any freshly issued transaction without invalidating the signature, hence resulting in a similar transaction under a different hash” (MTGox, 2014). Later in February, Mt. Gox issued a statement saying, “it had found a way to combat the loophole by issuing unique identifiers for each transaction. This, it said, should prevent ‘fraudulent’ abuse of the transaction process” (BBC, 2014). These unique identifiers had to be created by the Bitcoin core developers, who in turn would make the identifiers standard for all Bitcoins.

Supporters of Bitcoin believe that the currency will come out of this glitch stronger than it had been before. In Bitcoin's defense: transaction malleability was a known issue. Mt. Gox would have known about the issue since around 2011, which means they should have been prepared for the problem. When they developed their own software, they should have built in a defense mechanism to protect itself from this glitch. It is possible that Mt. Gox did not see it as a big threat, so it did not consider protecting itself from it in the beginning.

Mt. Gox eventually shut down its website and filed for protection bankruptcy from creditors. It was discovered that eight hundred and fifty thousand Bitcoins (or four hundred and fifty million dollars) were lost at the Mt. Gox exchange network. Since then, around two hundred thousand Bitcoins have been recovered. Computer hackers may be the sole cause of the lost Bitcoins.

### **Computer Hacking**

Bitcoin users should store their mined Bitcoins in a digital wallet; if a user does not store his or her Bitcoins in a digital wallet, then the codes are stored on the hard drive of their computer. If Bitcoins are stored on computer hard drives, they become easily accessible to computer hackers; several people have reported cases of losing millions of dollars' worth of Bitcoins due to computer hackers and lost hard drives. In 2013, a British man threw away a computer hard drive containing seven thousand and five hundred Bitcoins, worth seven million five hundred thousand dollars at that time. Instead of storing his Bitcoins in his digital wallet, he left them on a vulnerable hard drive.

However, storing Bitcoins in a digital wallet still leaves your virtual currency vulnerable. Digital wallets are also susceptible to computer hackers. The European Banking Authority has issued this warning to its citizens, "Exercise the same caution with your digital wallet as you would do with your conventional wallet" further urging users of Bitcoins, "not to store large amounts of Bitcoins in their digital wallets for an extended period of time" (Presse, 2013).

### **Terrorism**

Bitcoins have been linked to terrorist groups due to their anonymity and easy access. Terrorist groups like virtual currencies because it allows them to evade international sanctions. Having virtual currencies makes it easy to hide money and its trail from other people, especially governments, and therefore allows criminals and terrorists to carry out their illegal activities. I have already talked about the ability to launder Bitcoins, which makes the spread of terrorism easier.

## 4.2 Volatility

### Speculative Investment

Investing in Bitcoins can be very risky; the value of Bitcoins fluctuates all the time, so a user can never be certain of their investment. The reason price fluctuates so drastically is that the value of a Bitcoin is determined by its demand. The Bitcoin market is still very small; it does not take a lot to move the market price up or down, this makes the price of Bitcoin volatile. One day a Bitcoin can be worth one thousand dollars and the next it can be worth three hundred dollars. “The evolution of Bitcoin’s exchange rate shows how an immature and illiquid currency can almost completely disappear within minutes, causing panic to thousands of users” (European Central Bank, 2012).

These price fluctuations can make Bitcoins worthless and cause users to panic. Because price volatility is such a high risk, to some people, it may not be worth investing real, hard earned traditional money (euros). Bitcoin volatility means they will be hard to regulate. “Bitcoin remains immature and illiquid, which works against its adoption” (Browdie, 2012).

However, we will see the value of Bitcoins increase as more and more mathematical equations are solved and the maximum number of Bitcoins is reached. Once the maximum number of Bitcoins has been reached people will want to hold on to their Bitcoins and exchange them for the highest price possible. The reason for this is that there will only be twenty-one million Bitcoins available and as popularity increases so will demand. “Once the availability of Bitcoins stops, we can expect the value of Bitcoins to increase. Thus, Bitcoin users have a short-term incentive to hold on to their Bitcoins rather than trade them” (Plassaras, 2013). Once the maximum amount of Bitcoins has been reached, the high demand of Bitcoins will drive the price up, which means that users holding onto Bitcoins will receive a higher payout if they choose to sell.

### Unpredictability

Bitcoins are unpredictable and unreliable. When Bitcoin was first introduced the value of one Bitcoin was only thirty cents. It quickly rose to thirty-two dollars, but then dropped again. The value of a Bitcoin continues to fluctuate associated with financial current events. The highest value that Bitcoin has ever been worth was at the end of 2013, when the value of one Bitcoin was worth eleven hundred and thirty-five dollars. The value plunged to just below

seven hundred dollars after China declared that Bitcoins were not a real currency and would not receive the same legal status as other real currencies.

Back in 2009, China stated that using Bitcoins (or any other virtual currency) to buy goods would be illegal. At the end of 2013, the People's Bank of China prohibited Chinese financial institutions from using Bitcoins or handling Bitcoin transactions of any kind. China claimed that banning Bitcoins was the right thing to do, because they posed too much of a risk for their financial stability and trading sector; China was worried about the risks of money laundering and terrorist activities associated with the Bitcoin currency.

The price of a Bitcoin fluctuates based on the demand of the virtual currency. Just as I stated above, when China announced it would no longer continue handling transactions with Bitcoins, the value plunged by over twenty percent. The volatility, or price variation, of a Bitcoin is higher than gold and can be related to the uncertainty of its long-term value. The price of a Bitcoin fluctuates depending on what is happening in the financial world i.e. when the people of Cyprus resorted to using Bitcoin the value shot up and the value plunged back down when Bitcoin exchanges such as Mt. Gox go offline and lose user's money. For an average consumer, the risk associated with the fluctuating value of Bitcoins is a serious concern, which makes it impractical for a traditional currency substitute.

### **Irreplaceable**

A Bitcoin is irreplaceable when it is lost or stolen. Bitcoins are stored as a series of hashtags followed by ones and zeroes. Transactions are saved and made public for all users to see, but, with all this being said, Bitcoins cannot be replaced. Still, the safest place to store Bitcoins is in a digital wallet, because, if one's Bitcoins are lost or stolen, a user has lost everything. The biggest mistake a user can make is to store his or her Bitcoins on a hard drive, which is the most susceptible place for Bitcoins to be lost or stolen.

Along with the fact that Bitcoins are risky, linked to criminal activity, and irreplaceable, it seems that transactions conducted in Bitcoin are also irrevocable. This is bad news for the user who has decided he no longer wants the item he purchased with Bitcoins. "All these issues (criminal activities) raise serious concerns regarding the legal status and security of the system, as well as the finality and irrevocability of the transactions, in a system which is not subject to any kind of public oversight" (European Central Bank, 2012).

### **Users Bare All the Risks**

"The total supply of Bitcoins is expected to grow geometrically until it reaches a finite limit of twenty-one million. If, however, the number of Bitcoin users starts growing exponentially

for any reason, and assuming that the velocity of money does not increase proportionally, a long-term appreciation of the currency can be expected or, in other words, a depreciation of the prices of the goods and services quoted in Bitcoins. People would have a great incentive to hold Bitcoins and delay their consumption, thereby exacerbating the deflationary spiral” (European Central Bank, 2012). Users will have to hold on to their currency without the guarantee that it will be worth anything in the end.

We do not know how long Bitcoin will be around, but the risks associated with using a virtual currency will always be the risk of the user if Bitcoin is not regulated. The biggest problem with regulating Bitcoin is that by regulating the currency, Bitcoin loses all its appeal to users. “But the struggle to go mainstream exposes a dilemma at the heart of the Bitcoin movement: the thing that enthusiasts love most about Bitcoin--its lawlessness--is the same thing that keeps it on the fringes” (Westwood, 2013).

### **Data Protection**

Another con to virtual currencies is data protection. In this day and age, we have so much information about us online; the government can obtain that information at any time if it wanted to. Bitcoins may make our life easier, but with that comes a price. “Flexibility comes at a price; the entire history of Bitcoin transactions is publicly available. Casual users need to be aware of this, especially when sending Bitcoins to users and organizations with whom they would prefer not to be publicly associated” (Altshuler et al., 2013). I discussed this earlier in Chapter 2, with the help of block chain, transactions are made public.

Making transactions public is necessary. By having public transactions, the users can validate a transaction, which prevents double spending. Being aware of previous transactions helps keep the currency moving without the need of a central authority. Users do have a way to protect themselves. The first thing a user needs to remember is that their identity will always remain a secret, but their transactions will not.

A user can also protect himself by generating new keys for every transaction he conducts. “The payer and payee of a transaction are identified through public-keys from public-private key-pairs. However, a user can have multiple public-keys. In fact, it is considered good practice for a payee to generate a new public-private key-pair for every transaction” (Altshuler et al., 2013).

Another way for a user to protect himself from revealing information is to be smart about his internet activity; do not leave important information in a public place and make sure to use newly generated keys often. “A user can take the following steps to better protect their

identity: they can avoid revealing any identifying information in connection with the public-keys; they can repeatedly send varying fractions of their Bitcoins to themselves using multiple (newly generated) public-keys; and/or they can use a trusted third-party mixer or laundry” (Altshuler et al., 2013).

### **Lack of Acceptance**

A currency is only valuable if it is useable. Bitcoin has been around for years, but there are not very many places that accept Bitcoins as a source of payment. Because Bitcoin is not linked to a country or currency area, it is not linked to goods or services produced in a specific economy. Merchants who accept Bitcoins are the only ones whose goods or services are linked to Bitcoins. Merchants who accept Bitcoins (most likely) accept other currencies, so, where deflation is expected, a merchant can adjust the prices of their goods and services in Bitcoins.

When the value of Bitcoin was constantly changing, people became millionaires overnight. The problem was that they had nowhere to spend their money, because all their money was in Bitcoin and there were very little retail stores who accepted Bitcoin. ““The big challenge right now is people have not heard about Bitcoin,” says Joseph David, the CEO and founder of VirtEx, a Calgary-based currency exchange that trades Canadian dollars and Bitcoins” (Westwood, 2013). People would use Bitcoins more, if they were accepted everywhere and if people knew Bitcoin existed. “I would definitely use Bitcoin if it was more available in shops and other places but I do not know how many stores use it at the moment” (Dassanayake, 2014).

So, if a person has a lot of Bitcoins, but cannot use them, then the currency is not very valuable. Should a person who has millions of dollars’ worth of Bitcoins still be considered a millionaire? “We trust that dollars will be valuable tomorrow, so we accept payment in dollars today. Bitcoin is similar: you have to trust that the system will not get hacked, and that Nakamoto will not suddenly emerge to somehow plunder it all. Once you believe in it, the actual cost of a Bitcoin--five dollars or thirty--depends on factors such as how many merchants are using it, how many might use it in the future, and whether or not governments ban it” (Davis, 2011).

Convincing users to use Bitcoins as a means of payment and convincing merchants to accept Bitcoins, may be a challenge for Bitcoin. The lack of acceptance is a major problem, but every day more and more companies and businesses decide to start accepting Bitcoin

transactions. Recently, Apple, Expedia, and Dell started accepting Bitcoins. Hopefully, this sparks interest in other companies and gets more acceptance worldwide.

## **Conclusion**

These disadvantages are serious risks to everyday consumers, who try to augment traditional currencies with Bitcoin. However, an investor, who is patient and willing to accept that there are risks, could see high returns. The disadvantages discussed above result from non-regulation. It is important to note, most of these disadvantages do not outweigh the advantages as long as we impose regulation, which is the subject of the next chapter. Regulation could bring stability to Bitcoin.

## Chapter 5: In Defense of Regulation

Having seen in the previous chapters both the advantages and disadvantages of using Bitcoins as a currency, this chapter will highlight and argue for the merits of recognition and regulation of Bitcoin usage. I will briefly summarize the dangers of an unregulated Bitcoin, before I will look at the role of the Central Bank and, later on, the possibilities of regulation in Chapter 6.

### 5.1 Unregulated Bitcoin Poses Dangers

An unregulated currency is a liability regardless of if it is real or virtual. The biggest liability an unregulated currency presents is called a speculative attack. A speculative attack occurs when investors take advantage of weak currencies, currencies that have started to depreciate in value. What happens is that an investor will acquire a sum of the weak currency and sell it for a stronger currency; the investor expects to buy the weak currency back, but at a lower cost than what he sold it for earlier. The investor will make a profit if the weak currency has continued to depreciate in value.

Attackers will typically sell the weak currency to a commercial bank through contracts (usually long-dated). The bank is forced to take on the weak currency while it continues to depreciate, because these long-dated contracts take time to process. When the attacker buys the currency back from the bank, the attacker makes a profit while the bank takes the hit. The bank is forced to buy the weak currency for more than it is worth, because of the long-dated contract. If a bank is not able to hold off a speculative attack, the value of the weak currency continues to plummet and destabilize.

Banks can rely on their country's central bank in order to counter speculative attacks. Central banks are able to counteract speculative attacks, because they hold on to currency reserves that can be loaned out in times of trouble. If the central bank does not have a currency reserve, they can turn to the International Monetary Fund for assistance. The International Monetary Fund has a supply of currencies in case of emergencies, which is given to the International Monetary Fund through a quota system. Now what if I suggest that a wealthy Bitcoin investor decided to attack a currency, let us say he plans to attack the euro, what could the European Central Bank or the International Monetary Fund do if Bitcoins are unregulated?

The simple answer is that the European Union would have to buy up Bitcoins from an online exchange. But, if the European Central bank could not counteract the maturity mismatches suffered by commercial banks, it would have no one to save it. The European

Central Bank could not turn to the International Monetary Fund, because it will not have any Bitcoins and has no way to obtain them. “As a result, the International Monetary Fund is limited in what it can do to intervene in the event that a private digital currency like Bitcoin is used to attack the value of a conventional currency through what is known as a ‘speculative attack.’ If Bitcoin becomes an important currency in international commerce, its use in speculative attacks could cause serious economic harms unless the International Monetary Fund develops a way to counter them” (Plassaras, 2013). This means the International Monetary Fund would be unable to stop the speculative attack by the wealthy Bitcoin user; the euro would destabilize and the economy would take a nose dive.

“Without a reserve holding of Bitcoins, the International Monetary Fund is severely restricted in what it can do to assist member nations facing a speculative attack by Bitcoin users. Without the ability to offer digital currency as part of its currency reserves, the International Monetary Fund would be ill-equipped to ensure global economic stability in a future where digital currency becomes a major player” (Plassaras, 2013).

Could this actually happen? It is probable, but not very likely. Regardless, if someone wanted to take the euro down, it would be that simple; no one could stop it. Learning about unregulated currencies that could potentially destabilize a currency like the euro, is unsettling. The European Union needs to do everything it possibly can to protect its citizens and prevent disaster, which means the European Union needs to regulate Bitcoins. “Finding a way to regulate Bitcoin is critical in light of its potential destabilizing effects on the foreign currency exchange” (Plassaras, 2013).

### **Further Observations on an Unregulated Bitcoin**

By leaving Bitcoins unregulated, the European Central Bank is basically saying that anyone can create their own virtual currency and they would not need a license to do it; this could be a disaster. The defining feature of Bitcoins is that they are unregulated. If we choose not to regulate Bitcoins, it becomes obvious that anyone with enough money and technical background wanting to create a new currency will be allowed to without needing to obtain a license or permit from a regulating authority (central bank).

“The implications of this are significant and the inertia currently being demonstrated by the European regulatory authorities in dealing with such currencies provides no solace whatsoever. The truth is that it will most likely take a scandal to provide the necessary motivation to establish the clear regulatory treatment for virtual currencies. The recent Silk Road incident could very well be a foreboding of things to come” (Zammit, 2013). This is

why the European Central Bank needs to act fast and make a decision about Bitcoin while it is still in its early stages.

“It seems sufficiently clear that traditional fiat currencies as we know them will be challenged and radically changed, if not replaced, within a relatively short time-period, and if law and order are to be preserved in the course of this process, it is up to the world’s governments to act fast and ensure that the development of alternative forms of money is conducted within a framework of fundamental principles intended to preserve financial stability in the long run” (Zammit, 2013).

## 5.2 Why is it Necessary to Regulate?

Bitcoin may be young, but it has the possibility to become very popular and rival traditional currencies, which means that it would be better to create legislation now, rather than later. Bitcoin is very young. The fact that Bitcoin is regulation-free, transnational, and decentralized, leads to legal questions. Bitcoin is not yet widespread and is not as big as other international currencies, but, if Bitcoin continues to spike in popularity, regulatory measures will be needed.

There are countries in the European Union that have not taken an official stance towards Bitcoins and other virtual currencies, but as Bitcoins continue to grow, we will see more countries begin to create policies in order to regulate virtual currencies. “Further action from other authorities can reasonably be expected in the near future” (European Central Bank, 2012).

As Bitcoin becomes more popular it only makes sense for governments to try to figure out ways to control the currency, especially one that has a lot of risks such as Bitcoin. “It certainly would be appropriate for governments to ask questions about what the right legal structure would be for virtual currencies that involve nontraditional players” (O’Brien, 2014). I think the biggest hurdle a government will have to overcome in regulation is that of anonymity, because anonymity is one of the currency’s biggest attractors.

Bitcoin has a lot of potential. Without regulating the currency, governments could see negative effects on their economies, the risks already associated with Bitcoin usage could become exacerbated, and Bitcoin could further complicate law investigations. Monitoring Bitcoins should be among the tasks a central bank is required to do, because Bitcoin does pose a risk to traditional currencies.

## **Economic Threat**

Because governments are not really concerned with the risks Bitcoin poses to the currency backed by their central banks, Bitcoin is going to come from out of nowhere and it is likely to be devastating to the economy. “Bitcoin is going to disrupt the economy and society with breathtaking speed” (Duivestein and Savalle, 2014). Bitcoin usage picks up speed and popularity at the drop of a hat, so it could disrupt the economy just as quickly.

“Because Bitcoin is not formally backed by a country’s government, it is not bound by the International Monetary Fund’s guidelines. As a result, Bitcoin poses a serious threat to the economic stability of the foreign currency exchange if it continues to grow in both value and usage” (Plassaras, 2013). I explained more about the threat posed to the foreign currency exchange in the section: Unregulated Bitcoin Poses Dangers.

## **Exacerbated Risks**

Bitcoin poses risks and users bare all of these risks themselves, but some people may not even know of the risks associated with using Bitcoins. It would be a good idea for governments to make people aware of not only the possibilities that come from using virtual currencies, but also the devastating risks that could occur as well. “It is disappointing that regulatory authorities in the European Union and in the rest of the developed world have not taken any clear stance as to whether or not they intend to recognize and/or regulate these schemes. The prevailing uncertainty is discomfoting and poses several risks to naive consumers who are becoming increasingly interested in such virtual currencies, based on their misperception that such currencies could present investment or other opportunities, or real alternatives to traditional forms of money” (Zammit, 2013).

The lack of governmental interest allows for more criminals to take advantage of the benefits that come from an unregulated currency. The risks for merchants and consumers continue as governments and regulators delay taking action towards regulation and transparency on Bitcoins. Ill-meaning people can see this as an opportunity to continue creating unregulated virtual currencies. It also leaves ill-meaning people the opportunity to conduct illegal activities, without any consequence.

## **Investigation Complications**

One of the greatest advantages and disadvantages to using Bitcoin is the anonymity aspect the currency provides. By having a peer-to-peer anonymous payment system in an unregulated currency, we facilitate an environment in which criminals are able to cover up their trails. Because unregulated currencies allow criminals to remain anonymous and continue criminal

activity easier, regulation is necessary. “Nevertheless, if the use of digital money in itself complicates investigations and law enforcement, special requirements may be needed” (European Central Bank, 2012).

### 5.3 Central Bank Tasks

With the threat of virtual currencies rivaling traditional currencies, central banks need to be able to have control of virtual currencies in order to complete tasks that a central bank would have with traditional currencies such as price stability and payment systems. “Virtual currencies have become relevant in several areas that traditionally fall within the scope of the financial system and especially so in relation to the tasks of central banks. Consequently, it seems appropriate to consider the extent to which they might affect a central bank’s tasks in the areas of payment systems, regulation, financial stability, monetary policy and price stability” (European Central Bank, 2012).

The growing popularity of Bitcoin could be the end of central banks altogether. If there are no more central banks what will our economy look like? If Bitcoin goes unregulated it could have an economy of its own: on the internet. “If using Bitcoin becomes as easy as using a debit card, the European Central Bank may have reason to worry. The Internet could house, independent of financial regulation and policy-making, its own sprawling economy” (Westwood, 2013).

For now, the European Central Bank does not see Bitcoin as a threat, because Bitcoins do not manipulate the real economy. “Bitcoin and other virtual currency schemes present little risk to financial stability as a result of their limited ties to the real economy, but Bitcoin does fall within central banks’ responsibility to monitor” (Browdie, 2012). Central banks really do need to monitor Bitcoins, because, if Bitcoins become more popular, Bitcoin poses a lot of risks/threats to an economy.

### Conclusion

This chapter aimed at highlighting all the risks an unregulated currency poses to an economy. The disadvantages to the economy are a result of non-regulation. The European Central Bank needs to regulate Bitcoins in order to protect users from the dangers of Bitcoin and to protect the economy from the devastating risks an unregulated currency poses. Regulation could prevent the economic risks discussed in the chapter above. In the next chapter, I will evaluate existing regulation in European Union member states.

## Chapter 6: Existing Legislation

In this Chapter, an evaluation of how Bitcoin fits in the existing framework of individual member states legislation will be discussed. I will first highlight the European Union's opinion on Bitcoin. I will then list member states and discuss their differing interpretations of Bitcoin in existing framework or possible adaptations.

At the beginning of 2014, the United States Congress published a report on the regulations on Bitcoin found in diverse areas around the world. This report consists of forty jurisdictions that have had regulations or statements from central banks on the future management of Bitcoins. The report contains information about regulating Bitcoin, the affects Bitcoin has on national currencies, criminal activity, and how tax authorities view Bitcoins. "There is widespread concern about the Bitcoin system's possible impact on national currencies, its potential for criminal misuse, and the implications of its use for taxation" (Global Legal Research Directorate Staff, 2014). The results of this report indicate that, for most countries, Bitcoin is still in its experimental stage and real life data about how to deal with Bitcoin is still unknown.

The report contains information about several European Union member states and the European Union itself is included as well. The European Union member states which are included in the report differ greatly in how to deal with Bitcoin, which can cause extreme confusion. It would make things a lot easier and make more sense for the European Union if it were to make one overarching policy that would affect how Bitcoins can and will be used in all twenty-eight member states. According to a report by the European Parliamentary Research Service: "The multitude of approaches at member state level may mean that harmonization at European Union level will be needed" (Szczepański, 2014).

To reveal how confusing it is to allow each member state to develop their own policies and regulations on Bitcoins, I will divulge information about the regulations and policies in the European Union member states found in the report composed by the United States Congress. However, I will begin with the European Union's opinion first, to give a basis to start on and show how different the policies are between each member state.

The European Union does not yet have any policies or regulations on the Bitcoin system. The European Central Bank has issued a report about Virtual Currency Schemes, which discusses possible solutions to the Bitcoin system under already existing European Union legislation. For instance: the Bitcoin system could fall under the definition of the Electronic Money Directive 2009/110/EC.

Directive 2009/110/EC defines electronic money using three criteria: “it must be stored electronically, issued on receipt of funds of an amount not less in value than the monetary value issued, and accepted as a means of payment by undertakings other than the issuer” (European Central Bank, 2012). The Electronic Money Directive “aims at harmonizing the payment methods, increasing competition, and facilitating market access” (Global Legal Research Directorate Staff, 2014).

Bitcoin falls under the first and third criteria, but not the second. Article 11 states that member states have to guarantee the monetary value of the electronic money in possession to electronic money issuers. “This cannot be ensured in a virtual currency like Bitcoin” (European Central Bank, 2012).

There are others that suggest that Bitcoin falls under the definition of the Payment Services Directive 2007/64/EC. Payment Services Directive 2007/64/EC is also relevant to Bitcoin. According to this Directive, rules are explained for how transactions using electronic money should be carried out, however, it does not regulate the distribution of electronic money; it also does not revise the practical regulation of electronic money institutions as does the Electronic Money Directive. According to the European Central Bank (2012), Bitcoin falls outside the scope of the Payment Services Directive. The Payment Services Directive does not deal with electronic money and payment institutions are not allowed to issue electronic money.

Other individuals believe that Bitcoins could fall under the European Parliament Directive 2000/46/EC. Electronic money in the European Union’s legal system is regulated by Directive 2000/46/EC. According to this directive, “electronic money is a money value constituting an electronic counterpart of money signs.” The following characteristics must be met: “first, it is stored on an electronic information carrier; second, it is dispensed on the basis of an agreement in exchange for funds with the nominal value not less than this value; third, it is accepted as means of payment by entrepreneurs different from the ones who dispense it; fourth, on request, it can be exchanged for funds by the dispenser; and fifth, it is expressed in monetary units” (Szczepankiewicz, 2013). However, the Bitcoin system does not entirely fall under this directive either.

The issue of Bitcoin has been raised with the European Commission’s Payments Committee. “In the meantime, some initial attempts to define the legal status of Bitcoin are already happening in Europe. And finally, the issue of Bitcoin’s legal framework has been raised in the European Commission’s Payments Committee” (European Central Bank, 2012).

Nothing has been done as of yet, but, if Bitcoin becomes more of a threat, the issue will need to be dealt with.

The European Banking Authority has said that users of Bitcoin are at high risk: there is a lack of consumer protection, there is a huge risk of losing money, and consumers may still be subject to pay taxes when using Bitcoins. The European Banking Authority is the regulatory agency of the European Union, it advises the European Union institutions on banking and e-money regulation. The European Banking Authority has warned about the dangers of transactions of Bitcoin urging users not to hold onto virtual currency for very long, because it is irreplaceable.

The European Central Bank's report on virtual currencies concludes that, as of right now (2012), virtual currencies do not pose a risk to Central Banks unless Bitcoin becomes more popular and widely used. Further stating that if Bitcoin were to become more popular, it would probably be worth it to monitor developments as the situation could change and Bitcoin could become more of a risk. For now, the European Central Bank claims that there is not enough reliable information out there to make any real logical conclusions. "The assumption that virtual currencies will continue to grow means that a periodical examination of the developments is needed in order to reassess the risks" (European Central Bank, 2012).

For now, the solution is to wait and see what the future holds for Bitcoin, but that answer is unsettling. Bitcoin does not pose a threat as of right now, but, in the future, could rival the euro and destabilize the economy. If that happens, it will be too late for the European Central Bank to make regulations. The time is now, when Bitcoin is vulnerable, to decide whether the European Union will pioneer and regulate Bitcoin or shut it down altogether. There are so many differing positions towards Bitcoin in the European Union. It is quite confusing among member states. Next, existing policies of the member states will be evaluated; this will reveal whether any such country is pioneering more regulation and what the reasons and affects are.

In Belgium, there have not been any policies or regulations on Bitcoins made by lawmakers. Belgium is aware of the fact that Bitcoins are used for money laundering and other criminal activity, but the Belgian Finance Minister believes that "such problems should not be overstated." The Belgian Finance Minister does not see any present problems with price stability and does not see the need for government intervention in the Bitcoin system for the time being, there are no such plans for further regulation.

Bitcoin is not illegal in Croatia. This means that Bitcoin is not legal tender in Croatia, but can be used legally. Croatia does not see Bitcoin as an electronic currency, because

Croatia believes Bitcoin does not fit the characteristics of such a currency. Croatia has not made any specific guidelines regarding Bitcoin and has not made an official statement. The following comment was made by the Croatian National Bank: “money is a social institution, and that it is not unusual that money is evolving as influenced by the Internet, and established that Bitcoin is at the moment not regulated or directly monitored, but that regulation will probably in the future fall under the jurisdiction of central banks.”

Cyprus also does not regulate the use of Bitcoins. The Central Bank of Cyprus did issue this statement, “It considers the use of any kind of virtual money as particularly dangerous, given that it is not under any regulatory system and its operation is unchecked.” Cypriots have been very dependent on Bitcoin in the past and will most likely continue using Bitcoin, because trust in the government has been decreasing ever since the financial recession of 2011. I have previously discussed the financial situation in Cyprus during 2011 in Chapter 3, where there was a run for virtual currencies such as Bitcoin to avoid levies imposed on bank accounts to pay back the bailout money given by the European Central Bank.

Denmark will not regulate Bitcoin and does not define Bitcoin as a currency. The Financial Supervisory Authority in Denmark would like to see the Bitcoin system to be treated as an electronic service and any earnings from using Bitcoins should be made taxable. However, the Tax Authority in Denmark has not made any statement about the taxing of Bitcoin earnings. Denmark’s Finanstilsynet has made this statement, “It has evaluated the use of the Bitcoin system and found that Bitcoin does not fall under any of the financial services categories, including the issuing of electronic money, payment for services, currency exchanges, or the issuing of mortgages; thus, Bitcoin activity is not covered under current financial regulation.”

In Estonia, Bitcoins have not been regulated by any governmental action and is not being controlled. The Bank of Estonia does, however, monitor the use of Bitcoin, because it has become so popular and the use of Bitcoins by Estonians has grown. The head of the Payment Processing Department of the Bank of Estonia, Michkel Nymmel, has stated that Bitcoin does not present risks to price stability. Nymmel further stated, “While Bitcoin provides users with an alternative to traditional payment systems, the bank believes that there are numerous risks to customers owing to the absence of security mechanisms and credit protection measures.”

In Finland, the Finnish Tax Authority has issued policies for the taxation of Bitcoins. If a Finnish citizen transfers Bitcoins to another currency, there is a capital gains tax applied

to that transaction. If someone uses Bitcoins to pay for a good and/or service, then it is considered a trade, but, if the currency has increased in value after it was received, then that value is taxable. Any loss in value after the Bitcoin payment is received, that value is not deductible according to the Finnish Income Taxation Act. The biggest problem with these taxation policies is that Bitcoin is anonymous and there is no way to trace a transaction back to the user. In late 2014, Finland classified Bitcoin as a financial service, making it Value Added Tax exempt. “The Finnish Central Board of Taxes judged Bitcoin to be a financial service, which means that Bitcoin purchases qualify as ‘banking services’ under the European Union Value Added Tax Directive” (Hajdarbegovic, 2014).

In France, no policies or regulations have been made regarding Bitcoins. Under current French law, Bitcoin cannot be considered a currency or a means of payment system. The Banque de France warns French citizens of the dangers in using Bitcoin particularly because of price speculation and the criminal activities that are associated with the virtual currency. The French central bank has some ideas for a regulatory framework if Bitcoins were to be regulated, “The conversion between the Bitcoin and real currencies should be considered a payment service, which therefore could only be performed by payment service providers authorized and supervised by the French Prudential Supervisory Authority (Autorité de contrôle prudentiel et de résolution).” Banque de France believes, “This would help limit the risk of fraud during the sale or purchase of Bitcoins, and also help ensure that such operations are subject to existing regulations regarding money laundering and terrorism financing.” Any company that acts as a Bitcoin exchange is considered a payment service provider, which is subject to oversight from the French Prudential Supervisory Authority.

However, the first Bitcoin currency exchange to begin operating in the European financial system started up in France in December 2012. Bitcoin-central, owned by Paymium, offers a French payment account through Aqoba for Bitcoin customers. These payment accounts will allow Bitcoin users to buy euro-priced goods with a type of attached debit card; users can even have their salaries paid into these accounts. “The account can then be used to buy Bitcoin-priced products online through Bitcoin-Central and, alternatively, trade in Bitcoins for euros” (Westwood, 2013). People who feel more confident in Bitcoin than in the euro can then get paid in Bitcoin, then, when euros are needed, trade in their Bitcoins for euros. Bitcoin has become a type of safety net; which makes it more valuable to Bitcoin supporters.

Currently, France is pushing for stronger regulation of Bitcoin in the European Union counter-terrorism area; this comes after the Charlie Hebdo terrorist attacks in January 2015.

After the attacks, it was discovered that the terrorists had used digital wallets to transfer Bitcoins. France called for the European Union to adopt a strict position on electronic currencies, particularly their anonymity. France would like the European Union to prohibit anonymous transactions and require that transactions be more transparent.

“Possibly the first country to regulate the Bitcoin market was Germany. The German Bundesanstalt für Finanzdienstleistungsaufsicht (Federal Agency for Financial Market Supervision) together with the German Bundesbank and the German Ministry of Finance concluded that Bitcoin is a ‘unit of account.’ As a consequence, certain services related to Bitcoin, including the operation of a multilateral trading system, require permission from the German Federal Agency for Financial Market Supervision (BaFin)” (Krohn-Grimberghe and Sorge, 2013).

The Finance Ministry in Germany has declared, “Bitcoins to be a ‘unit of account.’ The designation stops well short of treating Bitcoins as currency or even e-money, but it does classify the virtual currency as a kind of ‘private money.’” (Der Spiegel, 2013). Bitcoins are legally binding financial instruments. Bitcoins are not expressed as legal tender, but they are units of value, which means they “have the function of private means of payment within private trading exchanges, or they are substitute currencies that are used as a means of payment in multilateral trading transactions on the basis of legal agreements of private law.”

At this time, banks do not need to supervise the way in which Bitcoins are used for payment or in how they are mined. Unlike Finland, Germany has not issued any policies on taxation of Bitcoin, but the Federal Ministry of Finance has issued a statement on whether value-added tax could be possible for Bitcoin transfers, transactions where Bitcoins are used as a means of payment (to make up for the lack of income tax on these transactions), and when Bitcoins are held for longer than one year (long term capital gains). According to an article in Der Spiegel (2013), a tax advisor stated that only when Bitcoins are used commercially, that value-added tax would have to be paid. “Ultimately, rules will have to be established for taxing transactions with those places of business. Germany has taken a first step in accepting payment by Bitcoin” (Der Spiegel, 2013).

Other news sources have chosen to speculate how Germany will tax Bitcoin users and at what tax level they will be taxed on. “This means that, like stocks or shares, any profit from them (Bitcoin, which is considered a form of money creation) is subject to Germany’s capital gains tax, at twenty-five pc – unless they are held for more than a year, Bitcoin will remain tax-free for personal use” (The Telegraph, 2013). Regardless of how the German Finance Ministry plans to tax Bitcoins, the problem with taxation ultimately lies in the fact

that Bitcoins are traded anonymously. “However, the ruling may prove difficult to enforce, as Bitcoin are traded anonymously, and therefore cannot be traced back to users” (The Telegraph, 2013).

“This classification by the German government gave Bitcoin legitimacy to be used as a settlement currency in one of the world’s largest economies” (Clinch, 2013). Germany is one of the biggest supporters of the euro. Angela Merkel is known for her austerity measures and constantly saying, “If the euro fails, then Europe fails.” “It is interesting that Germany has gone ahead and given legal status to the Bitcoin, as it could become an alternative to the euro if the single currency ever ceased to exist” (Clinch, 2013).

Greece does not have any policies or regulations on the use of the Bitcoin system. The National Bank of Greece has not even issued a statement or warning on the use of Bitcoins. However, there are businesses in Greece that accept payment in Bitcoins, but we do not know if this is considered legal according to the Greek National Bank. The Greek government does however use Bitcoins, which makes Bitcoin more important and valuable. “The fact that virtual currencies are beginning to affect financial markets and are being used by the Greek government to trade, shows their importance” (Chahal, 2012).

According to the Central Bank of Ireland, Ireland does not regulate Bitcoins, because Bitcoins are not considered legal tender within the European Union. However, there is no published statement from the bank regarding the use of Bitcoins. The Irish government has raised concerns about Bitcoin use and the ability to evade tax laws, but has been “advised” that currently, Bitcoin poses a small threat. “The Revenue Commissioners in Ireland are monitoring the development of the Bitcoin and considering its implications for possible taxation, with the most likely areas of taxation being in the taxation of any gains, as well as value-added tax, which is a charge on goods and services.”

Italy’s position on Bitcoins matches the European Union’s position. Italy implemented the European Directive of 2009, with Legislative Decree No. forty-five on 16 April 2012. The European Directive regulates and harmonizes the use of electronic currencies, which, to the European Union, Bitcoins fall under. The Legislative Decree outlines what electronic currency is, which includes how electronic currency can be issued and how electronic currency can be used for means of payment, and the decree ascertains who is/are allowed to use the electronic currency. The Italian Decree allows electronic currencies such as Bitcoin to be used in Italy, but Bitcoin usage is restricted to banks and electronic money institutions (“private legal entities duly authorized and registered by the Central Bank of Italy.”) “Italy does not regulate Bitcoin use by private individuals, and

currently the implementation of initiatives concerning the use of electronic currencies lies with the European Union.” Italy does not tax the use of Bitcoin.

Malta is also included in the report. Malta does not have any policies or regulations on the use of the Bitcoin system. The report made by the United States Congress could not find a statement on recognition of Bitcoins issued by the government of Malta. However, Bitcoin has not been considered a regulated instrument under the European Union’s Markets in Financial Instruments Directive 2004/39/EC, meaning that companies are allowed to use transactions in Bitcoins without the need of a license from the Malta Financial Services Authority. There is currently a Maltese company that uses Bitcoins for hedge funds. “The fund was ‘incorporated as a Bermuda exempted company and is registered as a segregated account company receiving funds at Citibank London.’”

In the Netherlands, virtual currencies (i.e. Bitcoins) do not fall under the Act on Financial Supervision. The Netherlands does not classify Bitcoin as electronic money, because it does not fit the definition determined by Dutch law. The Act on Financial Supervision defines electronic money as a currency which can be stored on an electronic device, can be recorded by an electronic money institution, which cannot be a bank but is responsible to obtain to issue funds in exchange for money and is issued to users other than the issuing user. As a result, under the definition made by the Act, Bitcoin is stored electronically, is issued in exchange for money, and is issued to users other than the issuing user. However, Bitcoins are not always issued in exchange for money and Bitcoin is not considered electronic money. A Dutch internet lawyer considers Bitcoins to be financial products, which means that Value Added Tax should be charged to Bitcoin users.

The Dutch Minister of Finance, Jeroen Dijsselbloem, has stated that he does not anticipate a revision of the Act on Financial Supervisor in order to include Bitcoins, because Bitcoin has a limited scope with a limited amount of acceptance by businesses, and does not have any real relationship to the real economy. “He emphasized that currently, despite the watchful eye of government authorities on the future development of virtual currencies, in principle the consumer is solely responsible for their use.”

The Dutch Central Bank has underlined the risks of using Bitcoins and other such virtual currencies. De Nederlandsche Bank has warned its citizens to be careful of the risks virtual currencies pose, because the value of Bitcoin is volatile and the bank does not supervise the rates. The (former) President of the Dutch Central Bank, Nout Wellink, warns, “dealings in Bitcoins is a bubble that is ‘pure speculation’ and ‘hype’ and ‘worse than the tulip

mania' of the seventeenth century because 'at least then you got a tulip at the end, now you get nothing.'”

Poland does not regulate Bitcoin at this time. In December of 2013, the Warsaw School of Economics held a conference: “Poland – A Bitcoin Superpower: Opportunities and Threats.” A representative from the Polish Ministry of Finance supposedly attended the conference and was quoted saying that, “the Ministry of Finance does not view the Bitcoin as an illegal means of payment, but also cannot recognize it as a legal currency.” Poland’s position on Bitcoin and other digital currencies is reported to be the same as the European Union’s position.

Szymon Wozniak, from the Ministry of Finance has stated, “Poland does not attempt to prevent the development of Bitcoin... We expect that the users will decide by themselves if the government needs to regulate and protect this area or everything shall stay as it is.” Taxation of Bitcoin was more certain, however. Wozniak reported that any type of income will be taxed under Polish law, as of now, “the law makes no distinction among the types of payments used to conduct transactions, including Bitcoin payments. According to him, all income received from Bitcoin transactions are subject to reporting and taxation.” The key word in this statement is reporting. The Polish government cannot tax something that they are not aware of.

In response to the study made by the European Central Bank, Portugal has issued a statement of their own addressing the problems with Bitcoin such as the lack of a central authority that is able to guarantee that transactions are final and irrevocable; Bitcoins cannot be considered a safe currency. There are currently no policies or regulations on the Bitcoin system in Portugal. There are not guidelines about the use of Bitcoins or how they are created and nothing has been defined as to who is responsible for transactions made using Bitcoin.

The Bank of Portugal does not issue Bitcoins in Portugal and cannot be held responsible for any problems associated with the currency; the user bears all the risks. Portugal defines Bitcoin as a “payment model of bidirectional virtual currency, in which the virtual currency competes with legal tender (i.e. the euro).” Bitcoin is growing, but the relationship with the real economy is still very limited, because Bitcoin has a limited scope with a limited amount of acceptance by businesses. Portugal is aware that the situation with Bitcoin could change further down the road, so it will depend on the European Central Bank to monitor the currency and act as they see fit on a payments model for Bitcoins.

In response to the Tax Administration of the Republic of Slovenia, the Ministry of Finance has issued this formal statement, “the Bitcoin is not a monetary means under

Slovenian law and not a financial instrument.” The Ministry of Finance does not see applicable provisions to businesses, which are using Bitcoins for transactions. However, the Ministry of Finance is unsure of how the issue of taxation on the Bitcoin currency will play out and will be done on a case by case basis. “Some income will be taxed. Income made by individuals is subject to standard income tax provisions, irrespective of the form. Bitcoin income will apparently be taxed by measuring the Bitcoin/euro exchange rates at the time of the transaction. Personal income tax is not paid on capital gains. Individuals who generate income by selling Bitcoins will not pay income tax. At that, profits derived from trading and mining Bitcoin are taxed as income under the provisions of Slovenian personal income legislation.”

This taxation policy will be a lot harder than the Slovenian government has in mind. Determining Bitcoin/euro exchange rates at the time of transactions alone will be very difficult and time consuming that is, if the Slovenian government has any information about the transactions being recorded by users in Slovenia in the first place. Certainly, there will be no record of individuals who are trading or mining Bitcoins, so taxation on those individuals is virtually impossible.

In Spain, Bitcoins have yet to be regulated and are considered to be illegal currency, because they are not issued by a central governing authority. Under the Civil Code, however, Bitcoins can be considered a good, digitally. Transactions made with Bitcoins are governed by the rules of barter according to the Civil Code. Businesses that use Bitcoins for transactions are required to make a receipt with a Value Added Tax in euros. Spain, along with the United States, has had to seize a sizeable sum of Bitcoins during an investigation of criminal activity (fraudulent transactions) done using Bitcoins.

Sweden was not included in the United States Congress report of 2014, but there are sources who report on how Bitcoins are accepted in Sweden. “Bitcoin is considered a ‘means of payment’ (medium of exchange) in Sweden. The effect of this is that anyone in Sweden, who intends to facilitate a market for Bitcoin, has to register with Finansinspektionen and fulfill the requirements on financial institutions” (Krohn-Grimberghe and Sorge, 2013).

The United Kingdom does not have an official stance towards Bitcoin. In 2013, the government of the United Kingdom conducted a high-level review of the Bitcoin system, but it chose to leave the currency unregulated even though there were a lot of concerns with the risk associated with Bitcoin and the currency’s lack of transparency. “Bitcoin is a high-risk system for its users from a financial perspective, and that it could collapse if people try to get out of the system and are not able to do so because of its illiquidity. The fact that the founder

of Bitcoin uses a pseudonym, Satoshi Nakamoto, and is surrounded by mystery does nothing to help promote transparency and credibility in the scheme” (European Central Bank, 2012). Her Majesty’s Revenue and Customs considers Bitcoin a single purpose voucher, which is subject to a Value Added Tax of ten to twenty percent. This policy has come with a lot of backlash from Bitcoin users and sellers saying that it damages the Bitcoin industry within the United Kingdom.

An accounting firm in the United Kingdom has taken the liberty to compile information about taxation of Bitcoin. They do, however, claim that not every case is the same, so the information found in their report has limitations. Their report discusses mostly about Value Added Tax. “If miners have produced Bitcoins and are holding onto them, no sale has occurred. Value Added Tax would only be chargeable on sale or use of the Bitcoins to buy goods or services” (MAH, 2013). This should come as a relief to miners (kind of), because this means, that as long as they are not using the Bitcoins they have mined to buy goods and services, that their Bitcoin stash is not susceptible to Value Added Taxes.

However, “If merchants accept Bitcoins as payment for goods and services, then they would need to account for Value Added Tax on their services as normal. The amount is likely to be the market value of Bitcoin as at the tax point. However, it may be possible for merchants to avoid Value Added Tax on exchanging Bitcoins for legal tender, as they would be used as consideration for a Value Added Tax exempt item (money)” (MAH, 2013).

The United Kingdom has a Freedom of Information Act and several Freedom of Information requests regarding the discussion of Bitcoins at different governmental levels have been denied in accordance with sections thirty-one and thirty-five of that Act. “Section thirty-one provides that information is exempt from the provisions of the Freedom of Information Act if it will prejudice law enforcement, with the reasons cited as ‘prejudicing the activities of one or more of the law enforcement agencies.’” This means that information being discussed about Bitcoin has the ability to prejudice law enforcement or law enforcement agencies. “Section thirty-five of the Act provides that information is exempt if it relates to the formulation or development of government policy.” This indicates that government policy towards Bitcoin could very well be in the works.

Although the United States is not part of the European Union, I have decided to include them in my research, because the United States is the European Union’s largest trading partner and their policies about Bitcoins could influence and affect how the European Union ultimately decides to handle virtual currencies.

The United States has yet to take an official stance on Bitcoins as well. There are politicians pushing for making them illegal based on the criminal activity and the risks associated with the currency. However, the Internal Revenue Services of the United States has made a policy about taxation of Bitcoin. “People love referring to Bitcoin as a ‘cryptocurrency,’ but the United States Internal Revenue Service looks at it a little differently. According to a new statement, Bitcoin is considered property, not currency” (Velazco, 2014), which means that all Bitcoin users are supposed to report their earnings to the Internal Revenue Services and pay taxes on them.

With Washington making policies, “Bitcoin proponents have reason to be concerned about Washington getting too involved. It could threaten users’ anonymity, a key characteristic of the currency” (Liberto, 2014). In order for Bitcoin users to be acknowledged by politicians in Washington, “Bitcoin companies are hiring lobbyists, visiting lawmakers on Capitol Hill and writing to agencies about how they should write rules that will determine the future of the fast-growing virtual currency. It is all part of a push to shape how Washington ultimately regulates the independent, digital money that is growing in popularity” (Liberto, 2014).

## **Conclusion**

While the general attitude of Bitcoin is still in an experimental stage, there is at least one member state (France) pushing for more regulation from the European Union. With regulation, the hopes of making the currency more transparent would restrict the possible misuse for illegal or terrorist activities. The possible outcome with the request from France, restricting anonymity, could make Bitcoin less attractive to users. However, with Germany’s interpretation of Bitcoin as private money, Germany appears to be the closest to accepting Bitcoin as currency. If the European Central Bank accepted Bitcoin as currency, this could legitimize Bitcoin making the possibility of universal acceptance more likely. With the differing opinions on Bitcoins, the need for one over-arching policy towards regulation from the European Union is apparent.

## Conclusion

This thesis set out to investigate the possible forms of regulation that the European Union has at its disposition. Furthermore, it sought to seek the “right” kind of action for the European Union, given the possibilities of this currency, the risks it poses and the possible scenarios that could play out in the future. In achieving this objective, several perspectives were developed throughout the thesis.

The premises put forth by Friedrich A. Hayek help frame the possible benefits of Bitcoin usage. Bitcoin is similar to the former gold standard in that governments are not able to manipulate the value, possibly preventing distorted interest rates and recessions caused by business cycles. Denationalizing money would make it so that currencies would no longer fluctuate based on governmental policies or special interests; the euro could rival the Bitcoin in this instance. Alternatively, the Misesian Regression Theorem helps develop possible shortcomings of Bitcoin usage. This theory suggests that Bitcoins do not have inherent value, so, unlike gold, Bitcoin does not express a certain purchasing power.

Under the current definition put forth from the European Central Bank, Bitcoin is not considered a currency. The European Central Bank classifies Bitcoin as a type of virtual currency scheme. Although not a currency, the European Central Bank still holds central banks accountable for transactions conducted in Bitcoins, therefore protecting users. Until amendments are made, Bitcoin will remain a type of virtual “currency.” Current prevailing attitudes reflect the experimental nature of Bitcoin, perhaps creating a type of “sandbox” environment, to allow the currency to develop and flourish before applying regulatory actions.

The advantages and disadvantages discussed in Chapters 3 and 4 should guide the European Union in making an informed decision on how to regulate Bitcoins effectively. The advantages shed light on how regulation would enhance the opportunities Bitcoins present to consumers, producers, and governments. The disadvantages depict the areas where regulation would be necessary; with regulation the disadvantages would not weigh up to the possible advantages. In order to protect users and enhance benefits the currency poses to users, regulation is required.

Possible forms of regulation the European Union has at its disposition include: transparency, central authority, and taxation. First, the European Central Bank would need to accept Bitcoin as a type of currency. Accepting Bitcoin as currency will legitimize the currency. After accepting Bitcoin as currency, the next step towards regulation would be

transparency (doing away with anonymity). One outcome of making the currency transparent is the potential of reducing criminal uses and terrorist activities. Potential consequences of accepting Bitcoin as currency and changing Bitcoin to be more transparent would likely lead to a temporary decrease in popularity.

Once the currency is considered transparent according to European Union standards, a central authority would need to be responsible for the currency. This central authority would need to establish, in accordance with other financial instruments, consumer protection mechanisms e.g. chargebacks. However, the central authority would not be able to have control over the value or the creation of Bitcoins. The central authority's role would strictly be to guarantee transactions and oversee activities. This would allow for safer transactions and also allow for the ability of possible taxation. Taxation would be possible at this point, however, it might be better for the currency to remain untaxable for a period until Bitcoin has become more developed, leaving Bitcoin in a sandbox environment where it can be monitored. By leaving the currency untaxable, popularity would likely increase.

The degree at which the European Union should regulate Bitcoin would need to be somewhere in the middle. The European Union will need to accept Bitcoin as a type of currency, make it more transparent, thus allowing for a central authority to monitor transactions. However, Bitcoin needs to remain in a sandbox environment to allow the currency the chance to develop. Bitcoins need to be monitored, but not in such a way that would decrease popularity to such an extent that users will leave the Bitcoin system altogether and find another unregulated (virtual) currency.

Word Count: 19,033

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