

# Msc Financial Economics

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Bitcoin: A qualitative study of a monetary alternative: It's value and applications.

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bitcoinmagazine.com. (2013). Altcoin [ONLINE].

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## **Research Motives**

For quite some time, I have been interested in monetary and fiscal policy. The interest was triggered during my studies in high school, in which I cursorily engaged with the fields of Finance and Economics. My interest was further nurtured - during my BA (hons) in Business Management with Philosophy & Ethics at Bath Spa University. Studying a joint honors degree has helped me to develop a strong awareness of how Economics is the interface between all business-related aspects of human actions. I am convinced that the mentioned correlation manifests itself in money, as it is the fundament of all aspects of economics.

More detailed have I been interested in the effect that the monetary policy of banks, central banks and government institutions has on economic development, political events and subsequently personal freedom.

Being part of the “Internet generation” (Tapscott, 2009), I have witnessed how the Internet has empowered individuals throughout the world in times of political oppression, as in the Arab spring (Wihbey, 2013). This has sparked my curiosity for crypto currencies and their potential as a monetary alternative, particularly the potential of crypto currencies to empower individuals and compass unfair government regulations.

The dissertation focuses on Bitcoin, the most notable crypto currency existing today and explores the need for monetary alternatives, elaborating on the potential of Bitcoin as such. The role that the internet played in the Arab spring manifests its potential as a tool of empowerment – a trailblazer for reform and betterment – with crypto currencies being the internet’s most recent figurehead of progress.

## Industry Descriptions

Since humanity became settled people have acquired specialized skills, paired with the possibility to travel and interact with other humans – this has created a base for trade. Money, which is the means of most trade and business-related human interactions, is the fundament of all existing industries. Therefore, there are various Industries that will be in the focus of this dissertation.

The banking sector will be brought into focus. The history of banking can be traced back to 2000 BC in Assyria and Babylonia and later Ancient Greek and Rome. Further archeological investigations have also identified bank like institutions in ancient China and India (Hoggson, 1926). All of these were high developed societies in need of an institution that engaged with deposits loans etc. Banking as we know it today can be traced back to renaissance Italy, serving as a base for growing international trade across Europe.

Today, banks can be found throughout the world, both - in the private - and government sector. Sometimes it is hard to distinguish between the two. A bank monitors monetary flow and serves as a resource for money, through being involved in borrowing and lending money. Banks are the backbone of the economy by offering fiscal services and further play an important role in the financing of businesses, enabling economic growth.

However, subject of the dissertation is not fiat money [government issued and regulated currencies (Frisby, 2014)], but digital money (crypto currency) and its potential as a monetary alternative (further elaborations on these terms will follow). Bitcoin serving as an alternative to money, as a means of exchange is a matured Internet opportunity for economic growth, with an industry in its early form of establishment. Figuring out how this industry should be shaped will be subject of the dissertation.

Bitcoin's potential manifests itself in the remittance market and e-commerce, through low transactions cost and fast payment process it bares as a peer-to-peer payment vehicle. The dissertation will explore the opportunities for both markets in detail, discussing the successful establishment and further actions of already existing Bitcoin exchange platforms, electronic wallets and other Bitcoin service providers.

## Literature Review

The bibliographical sources used for the dissertation have two points of focus. The first one is existing literature on monetary alternatives and payment systems. Most advocates of such literature, base their views on the thought schools of agorism and counter economics proposed by Canadian philosophers Samuel E. Konkin III and J. Neil Schulman (Frisby, 2014).

While reading up on the topic, my focus was lying on Austrian economics and methodological individualism. There is a wide variety of scholar's, authors and philosophers that composed writings of my interest. Mostly, the writings of Ludwig von Mises, Friedrich Hayek and Carl Menger that are concerned with issues of freedom and political philosophy. However through the process of conducting research I have come to the realization that it is more applicable to engage with recent written books dealing with the practical implementation of Bitcoin, as it is more useful to compose a dissertation with a more practical focus. This forms the second point of focus.

Four books have, in the end, been in the focus of my research. "Bitcoin The Future Of Money?" by Frisby (2014, London: Unbound.), a book that is written as an easy to read introduction into the sphere of Bitcoin and other crypto currencies, which has helped me to grasp an understanding of Bitcoin, its origins, potential and significance to involve the developing world into the economy. This understanding of how Bitcoin can challenge the existing economic world order has been further nurtured by the book "Crypto Currency. How Bitcoin and Digital Money are Challenging the Global Economic Order" written by Vigna and Casey - (2015, London: The Bodley Head).

"Mastering Bitcoin: Unlocking Digital Cryptocurrencies" by Antonopoulos (2015, Sebastopol: O'Reilly Media, Inc), deals with the technical aspect of digital currencies, such as cryptography and programming - however have I not included much information from this book, as the dissertation has its focus on practical applications of Bitcoin. None the less was it necessary for me to read, in order to form a deep understanding of the topic.

An American writer by the name of Champagne - has written a book by the title of "The Book Of Satoshi" (2014, United States of America: e53 Publishing LLC). The author examines the writings by the inventor of Bitcoin, Satoshi Nakamoto and other influential figures in the establishment of Bitcoin, such as Nick Szabo, Adam Back, Wei Dai and Hal

Finney. It is worth highlighting, that Satoshi Nakamoto, like Homer, could be a synonym for a number of people, no one knows who he actually is. Champagne's book has served as a transition between my first and second point of focus, the second to be online resources, such as blogs, forums, Bitcoin exchange platforms, and newspaper articles available online.

The status of Bitcoin being a digital currency, has led to many of the writings on it, being solely available online. There are a variety of sources, like the online presence of well-established news agencies, such as the BBC or CNN and newly launched news agencies like bitcoinmagazine.com and coindesk. The later provide up -to-date information on the topic of Bitcoin and serve as a platform for exchange for advocates of the currency. An extensive list of all bibliographical sources can be found in the Bibliography.

In order to compose a well-balanced academic piece of writing I also engaged with bibliographical sources that do advocate our current monetary system, for example writings of Alan Greenspan, who served as Chairman of the Federal Reserve of the United States from 1987 to 2006.

## **Introduction**

In 1716, when Isaac Newton had taken over the Bank of England, the monetary system of the Western World had seen its first “Great Recoinage”. This was followed by another “Great Recoinage” in 1816, when the Bank of England suffered massively from excess spending on the Napoleonic Wars (Westfall, 1993). The years 1913-14 saw the last fundamental change to the western monetary system, when the Federal Reserve Bank in the United States and Europe’s great powers moved away from the standard of gold (Westfall, 1993).

History has shown that the existing monetary system is inferior to the shortage of commodities and to the ruling of banks and government institutions. Germany, England and the USA had excessively overspent their funds by the start of WW I, and were forced to disband the interlinking of their currencies with gold (Frisby, 2014). Europe suffered a great inflation over the years following WW I, wealth that was acquired over generations was lost, existences destroyed. The problem remains today. Individuals who live in states with over-leveraged, vulnerable banking sectors such as Greece, Cyprus or Zimbabwe are exposed to arbitrary taxation and regulations (Frisby, 2014).

The following will show why there is a need for monetary alternatives, in order to protect individual freedom. Recently, Bitcoin has established itself as a possible alternative to existing currencies, especially where there is little access to traditional banking infrastructure, it has the potential to protect individual freedom and provide a platform for new kinds of trade and a fair redistribution of wealth.

The dissertation will focus on the potential that Bitcoin bares for the developing world, the remittance market and e-commerce. It will be elaborated on why the private sector is the key in establishing Bitcoin as a working monetary alternative. The dissertation will also elaborate in depth on Bitcoin’s relationship with physical currencies, exploring resulting problems and presenting solutions – focusing on a stabilization of the currency’s value and appropriate handling of security threats that the use of crypto currencies entail.



Lastly, the dissertation will address regulatory uncertainty that had a negative effect on both the public perception and price of Bitcoin. In particular, it will be addressed to what extent the government regulations are healthy for a monetary alternative, funded on the idea that there is a need to avoid government interference, as the structure of Bitcoin is a network of nodes that is based on collaboration of a large group of people and companies, not needing centralised control.

## Part I

The need for monetary alternatives: Bitcoin, an Introduction.

### **1.1 Need to protect individual freedom**

Societies that have neglected the importance of the individual have failed. The Soviet Union, the biggest communistic empire the world has seen, collapsed in 1991 (Plokhy, 2014). A political system of forced intellectual equalization and state-directed economy failed, leaving behind countries in state of economic hardship, and citizens without perspective.

Ludwig von Mises, an Austrian economist, philosopher and classical libertarian, argued that a person who is unfit to serve his fellow citizens wants to rule those (Mises, 1944). He believed that society must be carried on everyone's shoulders, through shared responsibilities. People don't need to be told what to do, but raised to be independent, educated individuals – making conscious decision for themselves. Tight state control and radically enforced community awareness is destined to fail. For that reason, everyone must engage himself into the intellectual. No one can refrain from doing so, as the interest of everyone hangs on the result. Whether we want to or not, all are part of the great historical struggle, to create a society worth living in (Hülsmann, 2007).

A failure to exploit our individual freedom leads to heteronomy resulting in the loss of economic and political sovereignty. Freedom is impartible. A citizen who has no choice in consumption or means of trade is deprived of self-determination. He is no longer a human; he becomes a puppet in the hands of the supposed supreme social engineer (Hülsmann, 2007)

There is a need to provide a platform for new kinds of trade and a fair redistribution of wealth. Until 1979 UK Government regulations, called for citizens to get permission to take more than £25 abroad. China, the world's second-largest economy, prohibits its citizens from withdrawing more than \$50,000 per year from the country. Economic or political crisis often cause capital controls (Frisby, 2014). In 2013 Cyprus experienced a banking crisis, causing capital controls to be introduced. Cash withdrawals were limited to €300 a day, large cash withdrawals had to be vetted and the cashing of cheques was banned. Accounts with over € 100,000 saw funds confiscated (Frisby, 2014). Greece has recently implemented similar monitoring of monetary funds as a result of the bankruptcy of the state (BBC, 2015)

In the past, governments have failed to install working mechanisms of financial control, and then called for citizens to pay for the profligacies of banks and government institutions. There is a need for a monetary alternative with a coupled platform of trade introduced that can serve as a counterbalance to the obscure and incompetently financial system in place today.

Globalization advocated by most industrial countries has led to an unavoidable interlocking of international interactions and financial transactions. Yet the existing financial system favors an unfair distribution of wealth. It is not accessible for most (Frisby, 2014). Citizens of undeveloped countries seek work opportunities in developed countries to support their families back home. Yet to send or receive money is expensive and inefficient, the global average of money being lost in the in-transparent sphere of finance bureaucracy is 8.3% (Antonopoulos, 2015). There is a need to establish a separation to two of society's most powerful sectors – government and finance - and empower the unbanked.

## **1.2 An Introduction to Bitcoin**

Money in electronic form is not new, electronic cash is reality since many decades, yet so far it has been controlled by centralized private institutions. In the US there are currently about 1.3 trillion dollars in physical existence of coins or bills (Frisby, 2014). That amount equals about 8% of all US dollars, with many of those printed notes being lost and between half and two-thirds being abroad, it is now though that just 3% of the US dollar in existence is actually existing in physical form. In the UK about 3-4% of money in banks exists in physical form; the remaining 96-97 % of money is almost all created digitally. Banks such as HSBC create this money when they make loans. For example, when issuing a mortgage (for which banks take the deeds of the house as deposit), the bank lending creates the money which is then paid to the customer - the money did not previously exist. Research by Positive Money has shown that money creation has been growing by 11, 5% per annum, since 1989 (Frisby, 2014).

Crypto Currencies are a medium of exchange, based on cryptography as a means of its creation, use and value. They are essentially digital currencies. Traditional centralized banking systems like the Federal Reserve System are subject to boards and government institutions controlling the supply and distribution. Crypto Currencies in contrast are entirely

produced by the cryptography system collectively, by a rate which is defined when the system is created and known to the public (Antonopoulos, 2015).

Bitcoin is the first successful attempt to create a digital property which can be sent securely to someone else without a third-party intervention. A monetary alternative backed by mathematical proof. As of today, no hacker has been able to either disturb the mining process or crack how to mine without using the required Bitcoin software with its internal security and self-relying value system (Antonopoulos, 2015).

American economist and Nobel Prize winner Milton Friedman, once said that real change can only occur in times of crisis, real or perceived (Ebenstein, 2007). In September 2008, the world was hit by a financial crisis that is considered by many economists to be the greatest the modern world has experienced. The bursting of the US housing bubble caused the US real estate market tied to the values of securities to cave, damaging financial markets and institution globally.

Under high pressure from the world of finance and banking the governments had to take drastic measures. Governments in Europe and North America ordered the European Central Bank and the Federal Reserve respectively to respond with unprecedented fiscal stimulation and monetary policy expansion. Luckily, the measures undertaken were successful. The global financial system, which was on the brink to collapse, was stabilized (Antonopoulos, 2015).

However, a great deal of people was unhappy with the way governments worldwide dealt with the crisis. Central banks were accused of saving a failed financial system and setting up the global economy for more trouble to follow. The cause of the crisis, which many believed to be an out of date monetary system and dramatic failures of corporate governance and risk management by - important financial institutions, were said to not have been corrected (Antonopoulos, 2015).

Some libertarians took it on themselves to create an impulse for the change they believed to be necessary. On August 18th, 2008, bitcoin.org is registered, till date it is unknown by who. Two weeks later, Satoshi Nakamoto published a nine-page paper, outlining a design for Bitcoin as a peer-to-peer electronic cash system. On January 3rd, 2009, UK Chancellor Alistair Darling announces his second bailout of the banks, parallel the first 50

bitcoins are “mined”. The starting shot for a new digital currency, with the potential to change the world (Antonopoulos, 2015).

Till WW I money used to be linked to a resource, such as gold (Westfall, 1993). As of today, money is subject to the despotism of banks. Gold is a physical resource, which has to be mined. Bitcoins also have to be “mined”. One can do so by downloading the Bitcoin software and run it on one’s computer. The mining process can be understood as a race to solve an algorithmic problem, whoever does so the fastest is rewarded with bitcoins. In the early stages, ordinary computers could “mine”, but as bitcoins have grown in value so has competition to mine them - as a result more powerful computers are needed. By mining one maintains the block chain and adds and verifies the records of every recent transaction on the public Bitcoin register - merging it all into a block, which is added to the existing block chain (Frisby, 2015)

A block is like a page in an accounting book, with the book being the Bitcoin block chain. Once a block is added, it can never change. One is ought to imagine a record of every dollar transaction ever made, that is what the block chain is for Bitcoin, a comprehensive public record.

In exchange for mining a block, one is rewarded with Bitcoins. Peoples’ incentive is to maintain the block chain out of self-interest. Bitcoin is a digital replication of the physical mining process. As the mine becomes deeper, it gets more expensive and labor intensive – caused by high electricity usage. The cost of Bitcoin production is the block-chain’s maintenance. “The system is self-reinforcing” (Frisby, p: 25, 2014). The ones mining become the public record keeper and regulators - acting like a decentralized bank.

Most importantly does the Bitcoin software provide a save way of transaction. In front of a website the letters ‘http’ appears, which stands for Hypertext Transfer Protocol. When typing an address, one sends an HTTP command to transmit the website and the website appear, provided from a different browser address. Bitcoin is also a protocol, with its function being to send and receive payment information. With Bitcoin - notice the capital B - , a computer reaches out to another computer. By doing so the computer provides binary-coded information proving to control a certain number of coins and the information that you wish to increase or decrease your controlled number of Bitcoins by engaging in a transaction with the other address, which also provides binary-coded information proving to control a certain number of Bitcoins (Frisby, 2014).

The unit of money used is bitcoin - notice the lower-case b. The Euro € is the unit of money used in European banking network, bitcoin is the unit of money used by the Bitcoin system, making Bitcoin a protocol and a unit of money (Frisby, 2014), an integral and decentralized, self-regulating, peer-to-peer payment system.

### **1.3 Cypherpunks and the origin of Bitcoin**

Bitcoin has its roots in an anarchic computing subculture. Its origin is the “Cypher Community”, computer scientist who base their belief system largely on libertarianism (Frisby, 2014). In 1992 a computer scientist who worked successfully for Intel, named Tim May, initiated a group of computer scientist who set out to use the potential of the Internet as a form of balance to the strict and privacy constricting regulations of the US government. The resulting mailing list through which those individuals communicated in encrypted mails was known as the “Cypher Mailing List”, with its members being known as “Cypherpunks”. They were opposed by the idea that when making payments online or when communicating online, one would have to reveal a vast amount of private information, which could then be used by government agencies or cooperation’s. One of their set out goals was to create digital cash, enabling peer-to-peer interaction, which would protect privacy (Frisby, 2014).

Various “Cypherpunks” proposed forms of digital cash within the “Cypher Mailing List”. The most notable ones were ‘b-money’ and bit gold, a form of digital cash proposed by Wei Dai, Nick Szabo and others. Both these currencies were based around chains of proven work. However, were these ideas never put into practice, until Bitcoin was introduced. This is essentially a combination of all ideas that came before.

“Cypherpunks” were very much concerned about not being traced and identified by the government. This has led to no one knowing who Satoshi, the inventor of Bitcoin, is. One of many circumstances, which have led people to dismiss the idea of Bitcoin, due to a lack of trust. It is due to the essential advantages of Bitcoin, that it has failed to be established as a successful monetary alternative or digital paying system yet. It is decentralized, unregulated and anonymous. The user has to reveal no personal information when buying, exchanging or mining bitcoins. An email address is enough in order to download the mining software, take part in the mining process or trade via an existing Bitcoin trading platform (Frisby, 2014).

The ulterior motive behind electronic currencies, which is to oppose the often-nontransparent decisions of government and financial institutions, which are perceived as unjust, has itself created space for criminal scheming. The most famous digital cash before Bitcoin was E-gold, founded in 1996. It was based on the idea that one could open an account, buy gold and then use the gold as a means of trade to other E-gold holders. Three years after its launch in 1999 it had already been praised by the financial times as a legitimate alternative to existing electronic monetary payment systems. In 2008 E-gold was processing more than \$2 billion worth of transactions. However, caused by the offered anonymity of its accounts, it was heavily operated by criminals for money-laundering and other criminal offences, resulting in a shut-down by the FB in 2009 (Frisby, 2014).

The public and many in the financial world dismiss electronic currencies as a failure due to the failure of many companies that have intended to establish such systems in the late 1990's and early 2000's. Bitcoin operates differently, it is not obliged to the control of a single company or an individual, and it is a self-regulating distribution network. Surely does it offer criminal minds the potential to use it for illegal activities such as money laundering. The question that has to arise is, if these criminal activities are significant enough to dismiss the idea behind Bitcoin and the need for a working crypto currency - surely not.

Criminal activities, which are defined by government given laws, are part of human interactions throughout history. Due to human nature, it will never be possible to annihilate criminal activity, only to minimize it. The existing financial system has created a system in which illegal actions, such as insider trading or the manipulation of the Forex, are often favored by the ones in charge, if these activities are profit maximizing (Boyle, 2014). It is therefore dispensable incorrect to dismiss the idea of a monetary alternative on the grounds of it being used by criminal minds, as the current monetary system is so as well. What is appropriate is to discuss how to implement cypher currencies as a working monetary alternative with its advantages yet acknowledging the disadvantages it brings and finding ways of improving these.

#### **1.4 Why would banks lobby governments to stop “crypto currencies”?**

“Congressman [...], the problem you are alluding to is the conversion of a commodity standard to fiat money...it is inevitable that the authority, which is the producer of money, will have inordinate power” - Alang Greenspan, former Chairman of the Federal Reserve Bank (Frisby, 2014).

The highly cost intensive WW I saw the creation of fiat money, a currency which derives its value from government regulation. Fiat Money places full control over inflation, monetary flows and its value to the government. During the years of the WWI, the most influential European countries such as France, Germany and England moved away from the gold standard, as they did not have enough gold to pay for the war expenses. By manipulating the money system, the European great powers could print money and run the war on high deficits (Antonopoulos, 2015).

Ever since fiat money is the core of our monetary system, which relies on the functioning cooperation between government institutions, central banks and private banks. This existing network seems to give a well-working base for carrying out decision regarding monetary policy quickly, reacting to market transformations. However has the establishment of fiat money allowed state intervention in our everyday life through monetary based policy with great effects, creating benefits for only few?

The addressed interworking between the three key players of the existing monetary system favours the ones involved, allowing banks to cash in. Most banks use their profit margin, which is the difference between the interest rate that is paid to customers in return for their deposits and then using these funds to lend to other customers, to engage in the financial markets. An increase in money leads to an increase in opportunities to gain higher profits in the financial markets. The advantages of the increased amount of money, heavily benefits the financial sector, which is dominated by banks. The CPI (Consumer Price Index) is used to estimate inflation. It tracks the prices of most commonly consumed goods. Since 1989 the CPI in the UK and the US has averaged just fewer than 3%. Yet the amount of money supplied has increased by 11, 5 % per year (Frisby, 2014).

Government money supply has grown disproportional to real income; from 1971 till 2014 the money in existence in the UK has increased 67-fold. Research has shown that only about 10% of the newly created money ends upon consumer good tracked by the CPI, yet 37% have gone into the financial market and 40% into residential and commercial property (Frisby, 2014). Concluding the institutions that are entrusted with making decision regarding monetary policy, benefit from the monetary system in place.



## **Part II**

Paving a successful way for Bitcoin as a monetary alternative.

### **2.1 Why Bitcoin is an irresistible force**

Innovation bares great risk and the opening of traditional structures of power will always be opposed by the ones benefiting from these. Not all types of Innovation succeed nor are they destined to do so, only the ones which are capable of providing a solution for an existing problem.

A base for forming an opinion about the monetary order in place should be based upon the rational principles of today's democratic and advanced industrial nations, following a monetary system should create a structure of fair distribution of wealth, with equal opportunities and equality of reward of achievements. Judging by these, the monetary order in place today is not the best possible one, which is a problem.

The UK currently experiences the biggest widening between parts of the population with a high and low income, outdated financial and tax system create an unfair distribution of wealth. Increase in income inequality has been driven by the very rich 1% of earners keenly increasing their wealth, pulling away from the rest of society. Studies further suggest that changes in inequality between 1985 and 2005 affected economic growth between 1990 and 2010 (Appendix 1). An increasing gap between the high and low income groups has knocked almost 9 percentage points off the Gross Domestic Product (GDP) in the UK and between six and seven in the US, Italy and Sweden in the two decades pre-recession (Chorley, 2014).

There is a need for a solution to this problem. Bitcoin proves itself as the first solution to be taken seriously. It could be part of the answer to a fundamental question of our time: How to allow for a fair distribution of economic growth?

2014 has been the most significant year for Bitcoin so far. The crypto currency has been positively mentioned by Microsoft founder Bill Gates; Microsoft is now accepting Bitcoin payments (Franco, 2015). Same as DISH one of the largest pay TV providers in the United States. DISH has stated that it is part of the companies' constant efforts to deliver the best and most convenient choice to its customers (DISH, 2014) - a statement, that is key to Bitcoin's potential success.

For Bitcoin to succeed as an empowering tool for citizens, the latter have to demand for it to be accepted as a monetary alternative by companies. In order for companies to do so, there is a need for providers that process Bitcoin's transaction in a trustworthy, ethical and fair way. Bitcoins success is dependent on the measures taken by the private sector.

Why should the private sector buy in? The Internet as a hub for development and opportunities is not new. It has created some of the most profitable opportunities and subsequently cooperations existing. The introduction of the first mosaic web browser in 1993 gave rise to several newly founded Internet-based companies, referred to as dot-coms. These companies went through an inexperienced period of short term growth, based on increasing stock prices and the markets confidence that those companies would turn the newly acquired capital into future profits.

The "dot-com" bubble reached its peak in 2000 with the NASDAQ closing at 5,048.62 (Cassidy, 2003). Cassidy describes "the dot-com" bubble as 'the greatest story ever sold' (2003). The following collapse saw an inflated market disrupted, acquired net worth vanishing and companies going broke, causing companies to vanish from the market completely. Others lost a large portion of their market capitalization but remained stable. Others later recovered and surpassed their dot-com-bubble peaks, like Amazon (Cassidy, 2003).

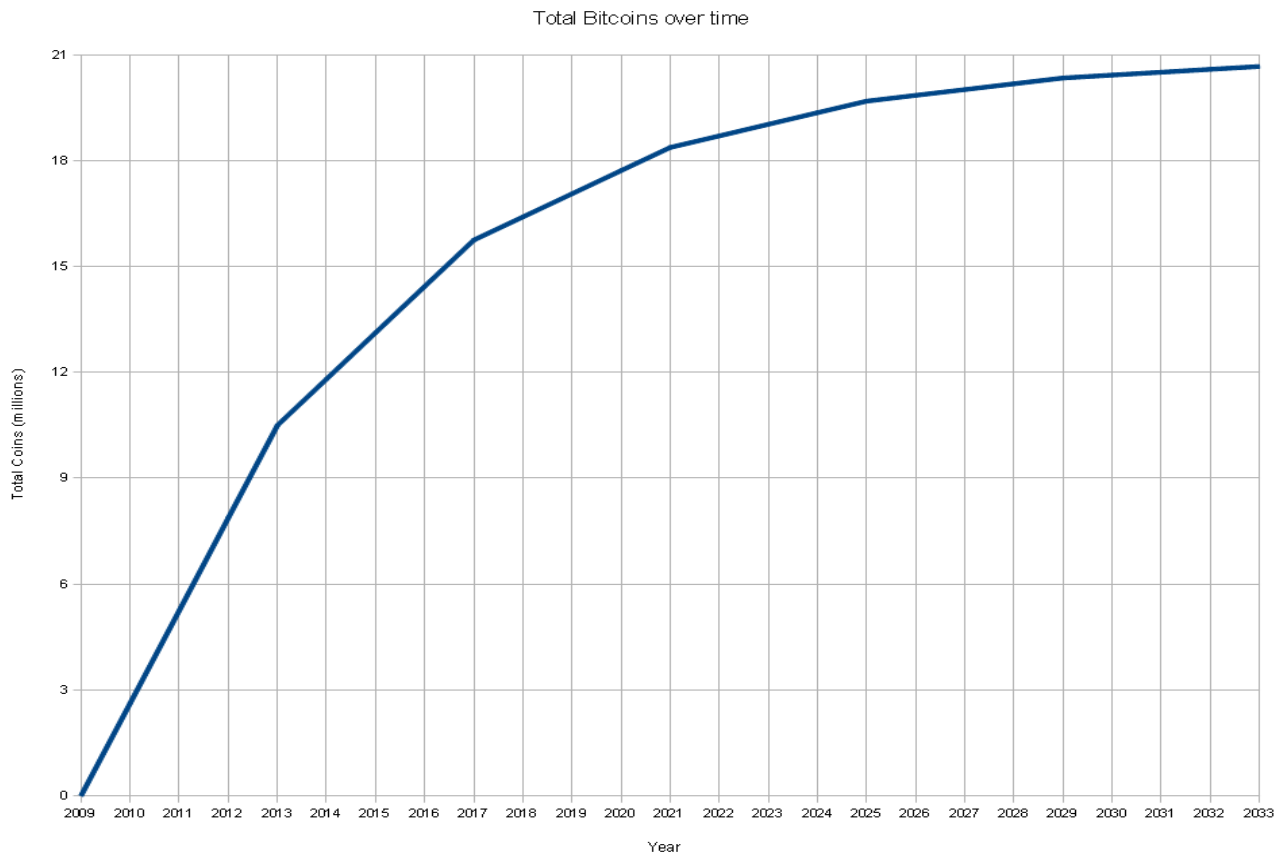
Bitcoin is a matured Internet opportunity for economic growth. It is designed bearing in mind the mistakes the markets have made in the past. Bitcoin captures a zeitgeist in a way that nobody could have foreseen (Frisby, 2014), but a generation of Libertarian-Internet scientists has dreamed off and worked for. It makes use of self-interest, creating an intrinsic value. It is the people's incentive to maintain the block chain. Bitcoin is a deliberate digital replication of value. The Bitcoin protocol does not only bare opportunities as a peer-to-peer payment system, which will be explained in more detail later, but also its production process creates short term profit, without affecting the long term value of the currency: making it desirable, for market participants to engage in the mining process creating a functioning framework for Bitcoin's future use.

In October 2013, Motherboard gained access to one of the largest Bitcoin mine houses, located in the Liaoning province in northeast China (Franco, 2015). The house is a piece of the infrastructure that keeps the crypto currency's decentralized network running, creating great profits for its owners. As the creation of a block chain is rewarded with the issuing of

new bitcoins. The mine cumulatively generates 4,050 bitcoins a month, equivalent to a monthly gross of \$1.5 million, their commutative computing power accounts for 3% of the entire Bitcoin network (Franco, 2015).

When Bitcoin was launched in 2009 each block introduced 50 new coins in the system. This quantity (50) halves every 210,000 blocks. So, the limit of coins is subject to  $210000 \times 50 \times 1 / 1 - 0,5 = 21000000$ . The Bitcoin software has a pre-defined schedule, "hard-wired" into the protocol. It limits the total number of Bitcoins so that they gradually approach a total of 21 million (ignoring those that have been lost through deleted or misplaced wallet files). There will never be more Bitcoins than this (eMansipater, 2011):

*Table 1 shows the number of Bitcoins over time (bitcoin.stackexchange.com)*



Bitcoin mining houses operate under great risk. It is yet unknown if these mining houses will be profitable. Entrepreneurs are racing to answer a question on the Internet, whoever does the correct calculation and finds the suitable algorithm, will be rewarded. Electricity is a high cost for the mining operators; the usage is estimated to be about 1,250 kWh, accumulating a cost of \$80,000 per month. As long as the Bitcoin market will operate smoothly and legally,

the governments worldwide have to eventually support it, as Bitcoin is an irresistible force (Franco, 2015).

The Bitcoin protocol offers enormous savings for people who wish to engage in business with each other, in particular for smaller business, it lowers the transaction cost for a variety of people who are disadvantaged by the current financial system. That is set out to maximize profit rather than to provide a platform for new kinds of trade and a fair redistribution of wealth.

Roman Leal, a renowned Goldman Sachs IT analyst has issued a report in which he calculates the savings that could have been made possibly in electronic payment throughout 2013 using Bitcoin. Is it doubt-worthy if the majority of the population will trust in a newly developed peer-to-peer payment system and with the block chain of the Bitcoin protocol not being fully developed, there is no proof it could manage such high levels of volume, further could regulating and operation cost of Bitcoin, once being successfully established rise, yet the detected numbers are astonishing (Frisby, 2014).

Retail and e-commerce is an economy highly dependent on electronic payments. As of now, retailers pay between 2, 5 % - 3 % in transaction fees. The Bitcoin payment system reduces this cost to 1 %, as it relies on a peer-to-peer payment service using the Bitcoin network as safe and fast way to transfer money. Leal has found out that in 2013, global retail sales were \$10 trillion, transaction fees in the retail sales were \$260 billion. With the use of Bitcoin, cost could be cut down to under \$110 billion, creating high savings of \$150 billion for merchants, especially for small ones (Frisby, 2014).

*Graph 1 shows possible savings for merchants using Bitcoin payment system in 2014*

Electronic Payments System in Place	Bitcoin Payment System
Global Retail : \$10 trillion	Global Retail : \$10 trillion
Transaction Fee: 2, 5 % - 3 % → \$260 billion	Transaction Fee: 1 % → \$11 billion
	<b><u>Savings of \$150 billion for merchants</u></b>

What about the remittance market? A Mexican employee in the US might want to send money home, using established money transfer networks like the Western Union one might pay as much as 10% of the amount transferred as transaction fee. Again, using Bitcoin service providers such as Coinbase, that cost could drop to less than 1%. In 2013 there were roughly \$550 billion of international transactions performed with \$49 billion of transaction fees, using Bitcoin these fees would fall to about \$5.5 billion. As a result, an extra \$43 billion of money would stay in the consumers pocket and would stimulate the economy (Frisby, 2014).

*Graph 2 shows possible savings for individuals making int. payments using Bitcoin payment system in 2013*

International Payment Methods in Place	Bitcoin Payment System
Int. Transaction Performed : \$550 billion	Int. Transaction Performed : \$550 billion
Transaction Fees (up to 10%): \$49 billion	Transaction Fees (as low as 1%): \$5,5 billion
	<b><u>Savings of \$43 billion for consumers</u></b>

Consumption has been given the most important role in the income and employment theory by many; most notably by Keynes, who argues that if consumption decreases so will the demand for goods decrease, resulting in a fall in production, possibly leading to unemployment. Subsequently consumers will have less income, consuming less, which will eventually have a negative effect on economic growth and financial stability of an economy (Keynes, 1993). Consumption plays an important role in the determination of income, output and employment in a country. Consumption is the base of all economic activities and therefore key. Adam Smith argued that consumption is the purpose of all production. As production increases with increase in consumption, he believes it is the consumption of goods that necessitates their production. Further would a higher consumption increase the state's tax revenues (Chand, 2015). Pursuing this argument; Bitcoin provides a peer-to-peer payment system, which allows for more money to stay in the consumers pocket and which adjacent can be spend through consumption, creating economic growth. Making it an irresistible force.

## **2.2 Bitcoins potential and how to make use of it**

### **2.2.1 E-commerce and the Internet**

Out of seven billion people living on earth today two billion are banked and participate in e-commerce. Yet about five and a half billion people have at least some access to the Internet, resulting in a potential of three and a half billion people who could participate. With a new decentralized, monetary alternative, there is a latent potential of three and half billion new customers to be involved into e-commerce. Creating huge possible profit margins in the long term for companies in the Bitcoin space, if structured and positioned right. It might not be beneficial for existing payment systems such as PayPal, but for the economy as a whole and consumers participating. Bitcoin is going to improve e-commerce, potentially unleashing a global economic boom. The Bitcoin protocol laid the base for a drastic increase in exchange, which is the essential process by which mankind prospers and progresses (Frisby, 2014).

According to the State of Bitcoin (2014), issued by Coin Desk, around 60,000 businesses currently accept Bitcoin (Wright, 2015). Overstock became the first market-leading retailer to accept Bitcoin in 2014 as a form of payment. Taking between 2, 5% and 4, 5% out of the cost structure can be extremely beneficial for companies like Overstock, which operate on a thin gross margin. One of the largest Bitcoin exchanges Bitpay cooperates with 30,000 merchants globally, processing around \$1 million in transactions daily (Wright, 2015). Its rival Coinbase is one of the most innovative and most successful start-ups using the Bitcoin protocol. Coinbase main role is a consumer-friendly wallet; it also provides merchants with Bitcoin payment options.

The customer portfolio includes technology focused firms such as Mint, Glyde and Big Fish Games (Cawrey, 2014). The company's success is favored by a number of factors and serves as an example for others. A partnership with Silicon Valley Bank and a secure method of Bitcoin exchange via Bitstamp have helped Coinbase to become a business leader in the US, for their respective industry. Fiat money can be transferred into Bitcoin relatively easily and an easy-to-use payment system makes it attractive for partnerships with merchants. 25\$ million (Cawrey, 2014) have been raised by the company in late 2014, creating an environment for growth in which Bitcoin can establish itself as a monetary alternative to be taken seriously through using the means of a technology focused industry that is ever changing and growing at a rapid pace.

### **2.2.2 Why Bitcoin might be the next big thing in the remittance market**

Bitcoin's decentralized architecture relies on a peer-to-peer network of computers to proceed money transfers. Each part keeps the network alive and validates transactions, which are registered in the block chain. This ensures security, a Bitcoin can only be used if owned and cannot be used for more than one transaction at the time. Traditionally this requires a third party, banks or financial institutions - making transactions slow and costly. Transfers with Bitcoin are almost handled in real time. Currently it takes only up to ten minutes for a transaction to be approved. A typical fee, which is to be paid to the miner of the bit coin cost 0.00001 Bitcoins per transaction (Grailot, 2015), however the technology needed to engage in such transaction can be difficult to understand. Companies such as Cubits have emerged, serving as an intermediary between the consumer and retailer and parties engaging in trade. Technically these companies are third parties, however their impact on the transaction cost is less due to the fact that they can easily be skipped and are only used for convince and security, the transaction fee charged on top of the obligatory 0.00001 Bitcoins per transaction, is averaged at as low as 1% of the amount transferred (Grailot, 2015).

In 2014, India received \$71 billion through remittance and Mexico \$22 billion. Nigeria \$21 billion, Egypt \$17 billion and Vietnam \$11 billion (Appendix 2). In the Philippines, remittance are valued so high that returning workers from overseas are excluded from airport taxes and are given a fast-track passport-processing lane at Manilla Airport. In 2014 the Philippines received \$25 billion through remittance, yet only 27% of the population have bank accounts (Vigna, Casey, 2015), as a consequence only 5% of the remittance transactions were digital. Most transactions were made through networks such as the Western Union, who charge high fees up to 10% to finance their physical presence (Grailot, 2015). The existing financial system prohibits that homecoming funds get where they are most needed, in the consumers pocket (Graph 2).



The Bitcoin network creates several operating models that are currently shaped by start-ups serving as remittance operators. Currently the most convenient way is the transaction from fiat currency to fiat currency, as it is most likely to be accepted by the user

## Bitcoin Operating Models

1. Firstly, the sender transfers the local money to the remittance mediator who proceeds to send fiat money to the recipient, using Bitcoins to transfer money from one currency to the other.

**Sender** → Local Money → **Remittance Mediator** → Fiat Money [using Bitcoins to transfer money from one currency to the other] → **Recipient**

2. Secondly a sender who has access to Bitcoins sends these to the remittance operator who then sends fiat money to the recipient. This model relies on an easy access to Bitcoins, which is yet ought to be established in most parts of the undeveloped world. How this shall be done will be explained shortly (Grillot, 2015).

**Sender** → Bitcoin → **Remittance Mediator** → Fiat Money → **Recipient**

3. The third option makes full use of the Bitcoin network. It relies on the sender owing Bitcoins which are then sent through an operator directly to the recipient as Bitcoins. This requires both parties to own Bitcoins. This may be easy in developed countries thanks to electronic wallets and exchange platforms like Coinbase. Either way, it requires the recipient either to be able to exchange the received Bitcoins in fiat currency or to use Bitcoins to pay for goods or services which is not that easy as of now (Grillot, 2015).

**Sender** → Bitcoin → **Remittance Mediator** → Bitcoin → **Recipient**

### 2.3 Bitcoin's potential to bank the great unbanked

### 2.3.1 M-Pesa

Bitcoin has the potential to empower the great unbanked. Something similar is taking place in Africa, the fast-growing usage of mobile payments. Most notably, the use of the M-Pesa, in Kenya and Tanzania (Appendix 3). Pesa is Swahili for money and M stands for Mobile. It is a form of “mobile money”, a “mobile-wallet”. It’s origins can be traced back to the early 2000’s in various African countries (Frisby, 2014). People started transferring their mobile airtime. At first people were only trading between friends and family, but then businesses picked up on it and it became a common form of trading/payment currency. In 2007 the two largest mobile network operators Vodafone and Safaricom picked up on it and introduced system to regulate and alleviate it (Vodafone, 2015). Customers can deposit and withdraw money from airtime resellers and retail outlets who act as banking agents. Airtime, “M-Pesas” can be send via text message. As of 2014 M-Pesa is used by two thirds of the Kenyan population (Appendix 4) and about 43% of the national GDP flows through it. This enables unbanked citizen to have access to basic financial services. Mobile phones are replacing banks (Frisby, 2014).

The success of M-Pesa emphasizes that people in developing parts of the world are in desperate need of new and better ways to send money. Transactions fees range from only 0.16% up to 0.66%, depending on who is involved, and the amount of money transferred (Cawrey, 2013). Currently it looks like through its simplicity and investment capital behind it M-Pesa provides the easiest alternative to traditional banking in India, Rural Asia, Africa and South America, but one day Crypto Currencies will meet that need. SMS payment systems have been developed for Bitcoin and are being introduced to markets. The SMS payment system bares one of Bitcoins great potentials. The key is to make Bitcoin easier to use for ordinary people who have heard about it in the news but are not particularly technically affine. If done Bitcoin can not only be used with a computer but on 6.8 billion mobile phones already being used worldwide (Cawrey, 2013), creating great market potential to be further explored.

Bitcoin wallet service Coinbase has introduced a SMS interface, enabling it’s customer to send and receive bitcoins via text message. The service can be used regardless (Spaven, 2013) of the network and whether a customer has a smartphone. To use the service, a customer needs to create a Coinbase account, verify one’s phone number, select a six-digit pin and click the ‘enable SMS’ button. The service can be used to send and receive Bitcoins

as peer-to-peer payments using an email or phone number of your choice and to buy and sell Bitcoins using a connected bank account (Spaven, 2013).

It is the key to make such services universal applicable to explore existing, unexplored market opportunities. Fred Ehrsam, co-founder of Coinbase argued that ““There are many in the world that don’t have access to a smartphone, and there is a large overlap between that group and the unbanked. As a result, adding an SMS interface helps us begin to reach some of the people in the world that stand to gain from bitcoin the most.” (Spaven, 2013). About 80% of the Kenyan population now has access to financial services, excluding M-Pesa this number would drop to 23% (Spaven, 2013). The M-Pesa has since been launched in India, Afghanistan and parts of Eastern Europe. Currently M-Pesa has the greatest impact of all monetary alternatives as it is not reliant on Internet connection, most of rural Africa and India as of today do not have extensive Internet coverage, but these areas have great mobile phone and network coverage.

The success of M-Pesa is not a barrier for Bitcoin, it is an opportunity. M-Pesa has the potential to help individuals understand the need for monetary alternatives and make people familiar with new easy to operate financial services. As M-Pesa is reliant on an outdated technology, there will be a need for suitable alternatives in the near future. Kipochi, a UK based Bitcoin wallet service has launched a product that allows people in Africa to send and receive bitcoins, plus to convert them to and from M-Pesa (Spaven, 2013). The service allows Kenyans to transfer money easily, fast and less cost intensive than using services offered by banks and remittance services such as Western Union. Pelle Braendgaard, co-founder of Kipochi has acknowledged the great success of M-Pesa arguing that it is the next logical step to integrate it into the Bitcoin network. As M-Pesa has been around in Kenya for years, making mobile money part of everyday life, which means that it will be easy for users to accept a digital currency as their choice for international payments (Spaven, 2013).

Kenyan communities have been established all over the world, additionally there are several large communities such as Ethiopians and Indians living in Kenya. Kipochi is set out to make it easy for these people to send and receive funds using the Bitcoin network, spreading an acceptance for the digital currency.

Bypassing traditional banking, bares great potential for the developing world. In the great boom that China has enjoyed in the last three decades, something extraordinary happened. When the country developed its telecommunication infrastructure, it laid down hardly any cables and wires. Technology has been so advantaged by that point that China was able to go straight to wireless telecommunication. Through the use of M-Pesa and other currencies, an acceptance for alternative currencies has been created, through which the developing world can bypass traditional banking, like China bypassed cables. Banks monopoly on money and payments that they have held for so long is under thread from more convenient and efficient systems (Frisby, 2014).

### **2.3.2 Emerging Wi-Fi coverage in the developing world and its potential**

Eventually the developing parts of South America, Asia and Africa will be fully covered by wireless Internet, as much as the developed world is today. The M-Pesa has taken Kenya by storm, due to its easy to use nature. Bitcoin has the same opportunity. India as a nation has strong ties to Kenya due to their shared history of colonialism, there is a large Indian population in Kenya (Aiyar, 2015). The acceptance for digital currencies in Kenya has the potential to affect India. Telecom operators, who played a significant role in the establishment of M-Pesa and who benefit from it, are the key. The global telecom infrastructure provider UTStarcom is confident that India's largest 20 cities will be fully covered in Wi-Fi by the end of 2015 (Indo-Asian News Service, 2015). The use of Bitcoin in developed parts of the world has yet failed due to its relatively high cost, caused by intense cost for carrying data. With the spread of Wi-Fi, the cost of carrying data will be around on-tenth of the cost it is today. The spread of Wi-Fi in India, the world's second largest country by population (Cohen, 2001), is given priority to by the government. UTStarcom has been backed by India's IT Minister Ravi Shankar Prasad, who has induced to minimize government regulations to increase affordable connectivity (Indo-Asian News Service, 2015). India as the tech-hub of the developing world (Cohen, 2001) bares great opportunities for the Bitcoin community. The most important tool to make use is a smartphone. The company behind Firefox, Mozilla is selling basic smartphones especially developed for emerging economies for as low as \$25 (Vigna, Casey, 2015), helping to make Internet usage a common practice.

Following in India's footsteps, Africa (which has jumped on China's globalization-led economic progress) will be the next part of the developing world to increase its Wi-Fi coverage. The continent is slowly fostering small but vastly growing hubs of prosperity and technological hot spots influencing the online community. Nairobi in Kenya has been named the Silicon Savannah (Vigna, Casey, 2015). An increasing number of US start-ups operating in the Bitcoin sphere, such as 37Coins, that have gone through the Silicon Valley accelerator progress, cooperate with companies from Nairobi and other tech-hubs of the developing world.

The companies' service allows anybody with a plain-vanilla feature phone, to send money via SMS, similar to the effort mentioned opportunities the M-Pesa bares. 37Coins cooperates with locals who are in possession of an android smartphone, which are used as gateways to transmit messages making use of the decentralized Bitcoin network. In return, the providers of these gateways receive a small fee, providing a benefit of giving the local population an opportunity to create a little business for them by enabling the movement of traffic (Vigna, Casey, 2015). The cooperation between tech-startups from the developed world and the undeveloped will be important to make Bitcoin a success in the long run, tackling an existent lack of perspective and prospects for people living less developed areas. Existing financial institutions have failed to do so yet.

#### **2.4 On the importance of the developing world for the future of Bitcoin**

A common argument claiming that undeveloped nations are not capable of using new technology like Bitcoin is their assumed degree of illiteracy. This argument is ought to be dismissed. The developing world is considerably more literate than it was fifteen years ago. Low-income-country literacy measured by the World Bank jumped from 50% to 71% from 1999 to 2012 and middle-income-country literacy went to 91% from 83%. Despite those changes, the majority of these people are unbanked. Not caused by a lack of education, but because of structural and systematic obstacles facing people of limited means, badly developed systems of documentation, corruption and cultural snobbery (Vigna, Casey, 2015).

The developing economies are more open to the kind of change Bitcoin bares. Within developing countries great challenges exist in day-to-day commerce. Banks are not interested in providing service for these people. The poor don't offer big profit opportunities and live in

places where the infrastructure and security needed for the construction of physical bank branches is not existent. Integrating a third of humanity living under poverty financially could create great new opportunities for world trade (Vigna, Casey, 2015).

Emerging economies such as India or Tanzania have a much larger self-sustaining entrepreneurial class (Vigna, Casey, 2015). Small business owners are the backbone of emerging market-economies, for these people the ability to save cost on financial transactions can make a huge difference to their profitability and creates opportunities for expansion. If someone is living of \$50 a week, then the possibility of saving \$5 will matter. A tailor serving local markets in Dhaka (Bangladesh) , may widen her product line if she is able to send money to a fabric producer in Chittagong (Bangladesh) , 160 miles away and if she finds foreign buyers willing to pay her in Bitcoin, she may have an additional export income (Vigna, Casey, 2015).

There is a lot of promise in the developing world for the Bitcoin community, but big barriers in these countries remain for the rollout of crypto currencies. Some are linked to social and cultural practices other to the flaws and risks of Bitcoin, which will be dealt with in more depth later. Individuals living in poverty may be very risk averse to a new form of payment that not everyone accepts, and they might have not heard of yet. The obligatory fee of 10% to be paid to the Western Union for money transaction may be bothersome, but it has worked in the past. Besides, there are regulatory obstacles. Officials in developed countries nurse close relationship with financial institutions, which could create licensing obstacles. If too few people are willing to use Bitcoin, most people will be less willing to use it (Vigna, Casey, 2015).

Conventional marketing strategies, such as TV advertisement, print magazine advertisement or the use of Billboards might be helpful, but would not achieve the needed objectives (Vigna, Casey, 2015). Bitcoin is not a newly developed product, for which awareness has to be raised. Is a revolutionary and never before seen peer-to-peer payment system, that questions the financial establishment. An establishment, that has existed for many centuries and has proved itself as the best necessary evil to increase prosperity and monetary exchange. First of all Bitcoin users need an infrastructure to make it easy and cheap to convert digital currencies into local currency, meaning low-cost exchanges, brokerages and eventually ATM's that make use of Bitcoin (Vigna, Casey, 2015).

The question is where to start? The Salt-Lake City based online retailer [overstock.com](http://overstock.com), began to accept Bitcoin in 2014 and became the biggest revenue-earning merchant to do so. The company's CEO, Patrick Byrne believes the company can play a key role in creating a Bitcoin infrastructure in the developing world. Byrne emphasizes that the use of Bitcoin of the company's sales and buying department financial institutions can be cut out, bringing buyers and sellers in the retail sector closer together (Vigna, Casey, 2015).

Overstock works together with vendors in eighty different countries, of which fifty-four are developing countries. Among his suppliers many are small, low-income business owners from developing parts of the world, who contribute to Worldstock, Overstock's branch for fair trade products. These suppliers are in need of fairer financial system and a cheaper payment model. Byrne sees opportunities for firms like Overstock to build influence by leveraging Bitcoin in its international payment system and creating a starting point from which change starts influencing the world economy (Vigna, Casey, 2015). As some business owners adopt the digital currency, it becomes more appealing to others with whom they engage in business and privately. Once such a network is built up, people want to be part of it, because they do not want to be excluded and see the benefits of it. An incentive for merchants to accept Bitcoin as a payment could be an extra 1% to 2% given to them by Overstock. As the transaction fee would drop from 4%-5% to 1% this could be done easily. Secondly, the fact that a Bitcoin transaction allows for fast settlement, which lets vendors better calculate their revenue, is appealing (Antonopoulos, 2015). A fact, that has to be communicated clearly.

What Byrne plans for Overstock has significant parallels with what Wal-Mart accomplished by being a pioneer in communications technology, the company revolutionized supply-chain management in the 1990s and 2000s. Wal-Mart developed an advanced network in which all of its suppliers were tied into a single, integrated database for managing their services and goods coming in and out of Wal-Mart's warehouses. Paired with improvements in shipping logistic, the company was able to tweak its just-in-time inventory management to optimization, cutting its cost drastically. Wal-Mart used the saved cost to offer the cheapest price in the United States, becoming a cooperation that plays an important part in the world economy (Vigna, Casey, 2015). The Bitcoin protocol offers a chance for merchants in the

developing world, to have a more significant role in world trade, potentially unleashing long term economic growth in regions in need.

### **Part III**

#### Problems and Solution

##### **3.1 Bitcoin and its relationship with physical currencies**

Despite Bitcoins great potential for the remittance market and the e-commerce, there is a basic problem. The choices for spending Bitcoin are limited, as not many merchants accept it as a form of payment. The firm Annex in cooperation with a Bitcoin trading-platform called Atlas ATS is pursuing a solution to the problem, the establishment of an exchange platform based in Pakistan for swapping Bitcoins into traditional currencies, providing security for Bitcoin users (Vigna, Casey, 2015).

A country that has played an important role in the establishment of Bitcoin is Argentina. Traders listed on the currencies exchange in Buenos Aires tripled the number registered in Manhattan in 2014, and the largest Bitcoin meet-up world-wide is run by the “Fundacion Bitcoin Argentina” (Vigna, Casey, 2015). Firms such as the San Francisco based BitPagos offer a service in which they convert received dollars by hotels and other tourism-industry clients into Bitcoins. The South American country demonstrates how digital currencies can provide an escape for individuals who are jammed by capital controls. In June 2014 every dollar received by hotels from credit-card purchases, had to go through the Argentinian banking system, paying out 8.15 pesos (Vigna, Casey, 2015). However, a cash payment could be converted into 12 pesos in Buenos Aires city centre. Unfortunately most travellers use credit-cards for their payment, the use of Bitcoin offers merchants a middle-way, as BitPagos offers its clients a much better exchange rate, than banks. Argentina is experiencing cycles of financial crisis every decade or so. For merchants to be able to secure some of their revenue into digital currencies could guarantee a superior value. Inflation in Argentina has been about 30% in recent years, the use of Bitcoin is a way to assure against inflation (Vigna, Casey, 2015).

However, a main disadvantage that the Bitcoin community is facing currently is the unstable value. It takes away peoples trust in the digital currency, which is from importance



for its establishment. Adjusting product prices on a day to day and even hour to hour base is cost-worthy and almost impossible for retail companies operating physical branches. The digital currency may only be established as a monetary alternative, as soon as the fluctuating value of Bitcoin will be stabilized.

### **3.2 Stabilizing Bitcoin's value**

Bitcoin's short history has been defined by peaks and troughs. The news coverage has been both, extremely positive and negative. Consequently, this has had an effect on both the public perception of Bitcoin and its valuation. In January 2010, a year after the release of Bitcoins open source-software, its price remained stable at around 6 cent and began to rise. In November 2010 it reached 50 cents, with its market cap passing one million dollar (Frisby, 2014). In its early stages Bitcoin saw a healthy development in its value, however from April to June 2011 the price rose from 60 cent to 32\$. By the month of November, it had fallen to two dollars. Criminals and Hackers started to take notice and advantage of the volatile digital currency. The third largest Bitcoin exchange in 2011, Poland based Bitomat lost its wallet, holding a total of 17,000 bitcoins. In 2012 Bitcoins volatile price pattern continued (Frisby, 2014).

By March 2013 the market cap of Bitcoin passed one billion dollars. In January Cyprus experienced severe financial problems. The EU ordered that anyone with deposits worth more than 100,000 € would have 47, 5% of their money confiscated, to raise funds for Cypriots banks. Bitcoin became a way to escape capital controls, pushing the price to \$266 at its climax. The range was flat at around \$100 the following six months. Later the same year the currency rose to dubious fame when it was widely discussed in the international press in connection with the court case following the shutdown of Silk Road, an online black market that accepted Bitcoins as its form of payment. Eventually its value peaked at \$1,242, dropping to about \$237 by the end of 2013 (Frisby, 2014). As of August 2015 Bitcoins value is about the same as by the end of 2013 with notable fluctuations on a day to day bases ([plus500.com](http://plus500.com) , 2015).

Large price volatility is either caused by high volume selling or buying. Usually the motivation behind trading activities, are rarely obvious, not in the case of Bitcoin. The Crypto Currency rose to fame due to its connection with frauds and criminal activities. This has

caused the wrong crowd to get involved with Bitcoin. Traders were engaging with the currency as a form of asset to make short term profits on the market.

A stabilizing factor presents itself in the growth of the Bitcoin ecosystem. The price volatility will be reduced, as more information on Bitcoin spreads, and as more people are effectively part of the system. Recognizing the dynamics and use cases of Bitcoin precludes particular behaviours of quick buying and selling that have disturbed the price in the past. The private sector, with companies trying to build services around the Bitcoin technology predominantly has the responsibility for the education of the market. “Customer acquisition, media and political work and especially provision of trustworthy services all contribute to the growth of the user community and the education of people.” (Manigold, 2015)

In the short term the price will be influenced by the emotional feeling of the market. The big risk must be clearly addressed to make Crypto Currencies a reliable alternative to hard currencies and other options via the broader payment system. The risk includes security threats, foreign exchange and regulatory uncertainty. The slightest news can send the value of the currency doing loops. This creates risk coming with the newly developed exchange places that manage foreign exchange from bitcoin into hard currency, like the Euro or Dollar.

Most companies that dominated the Bitcoin markets in its early years such as MtGox have vanished today (Antonopoulos, 2015). Competition between firms will regulate the market and only those companies that build on the self-relying value system of the Bitcoin software will prosper in the long term, contributing to the stabilization of the currency. In 2014 Coinbase was able to “add some notable technology veterans to its team” (Cawrey, 2014). Former Facebook security director Ryan McGeehan and Amazon’s former director of business development & sales Todd Edebohl, have been hired, adding their extensive experience areas of security and business development to the company, two areas that are essential for the success of Bitcoin. Security threats will be subject later on.

Price volatility will also be limited in the future by a dispersion of services. Bitcoin, via the services supplied by the private sector, has already moved away from being seen as speculative asset to a transaction medium, a payment method and a store of value. The more these services are being developed, and the more liquid Bitcoin becomes due to smaller and more frequent use, the more stable the price will become. Companies in the space are developing a variety of useful business models, all of which will help to diversify the use of

Bitcoin and shift the public's focus from price of Bitcoin to its diversified applicability (Manigold, 2015).

It is difficult to predict Bitcoin's price in the long term due to a wide range of potential Bitcoin valuations, huge potential upside, and potential for market failure. However, this year Bitcoin has put the early stages behind. It has shown that it has many legitimate benefits to companies that are legal businesses, such as Dell and Expedia. Big-name investors have also added legitimacy to the Crypto Currency by investing in Bitcoin Start-Ups (Rosenfeld, 2014). Concluding, Bitcoin will slowly settle at an adequate price, overcoming price volatility in the next few years.

### **3.3 Security Threads**

Security is a major obstacle for the greater acceptance of the currency. The greatest advantages of Crypto Currencies are its easy nature of use, instantaneous delivery and anonymity – however, the latter is also its greatest weakness, as well as the digital storage. For a long-term success of the currency it is fundamentally important for security measures to be implemented effectively to ensure that business and private users are not put at risk through its use (Wright, 2015).

Benedikt Manigold, CFO of Berlin based Cubits, Europe's leading marketplace and online wallet for Bitcoin, explains that there is a reluctance of merchants and consumers to try out the currency, as a serious payment method besides fiat currencies. Manigold believes that the negative stigmata attached to it through the negative press in its early days hasn't been shrugged off completely yet. The digital currency is often associated with obscure online marketplaces, money laundering and illegal purchases. However, as Bitcoin is getting more attention, incidents have been reduced and controls and security has been increasing. There are a few security implementations necessary to open up the currencies' use to more people.

The aspect of storage, consumers and merchants want to know their funds are safe. They need certainty both in terms of cyber-crime protection and in terms of the institution guaranteeing their funds (Manigold, 2015).

Companies are working hard to counter cyber-crime. Wallet services are implementing cold wallets, which are safe offline storages. Cold wallets, which are not connected to the Internet, guarantee safety of funds. The hot wallet, which is online, is then filled (as necessary to service transactions) from the cold wallet. Cubits require the sign-off from more than one executive as an extra layer of security for this process. These actions have made it much harder for hackers to access Bitcoin funds. Besides traditional banks are not spotless in hacker defines either (Manigold, 2015).

Secondly does Manigold address the trust placed in the companies that hold your Bitcoin. As a form of reimbursement, most customers usually demand a certain guarantee of funds, in case the company goes bankrupt. Such a guarantee in the Bitcoin space can only come via collaboration with government bodies or insurance companies – the latter, however, most likely will not insure these risks as of today. But as services become more established, insurers are initiating the buildup of products around Bitcoin that could become very helpful (Manigold, 2015).

The actual transactions within Bitcoin are much safer than any traditional transfer processes. All executed transactions are on file on the block chain forever and therefore provable by any member of the system. Cryptographically sealed, one can even embed collaterals or conditions upon which payments can be fulfilled. Concluding, added security should be in the realm of fund safety and fund guarantees, as these are the currencies weak spots.

### **3.4 On the Definition of Money and Bitcoin**

Rothbard, a Jewish American economist of the Austrian School of Economics, believed that the workings of the economy as a whole are the sum of all individuals' actions. What differentiates the Austrian School of Economics is it's believe that no institutions could act as a central planner and be able to estimate the dealt aggregate offer and demand of any service or product. If central institutions intend to change an economic parameter (for example the interest rate under central banking), they could not correctly estimate the sum of all decisions on the consumers spending habits as well as the decisions of investors or businesses. Deviations between calculated expectations and reality are unavoidable and will lead to disruptions (Champagne, 2015).

The Austrian School of Economics brought out some of the greatest economic theories, however, is it a thought school which is not very practical. The School empowers the individual by granting it a high level of self-responsibility from which a collective responsibility arises. The political arrangements known as democratic states which dominate the western world today are however a fusion of millions of individuals, of which just a few are capable of consciously making self-reflective decisions. To demand a system which totally relies on everyone's individual room of development, a reality without regulations and any degree of central planning (state intervention) would cause most people to not unfold. Many would fall victim to anarchic capitalism and exploitation.

For Bitcoin to become a widely accepted monetary alternative, it must make a transition from a libertarian utopia to a practical convertible reality. As of now the Crypto Currencies' market cap has exceeded multiple billions, with an increasing tendency. Eventually government interference and regulations will be unavoidable. This flows from an analysis of Bitcoin's valuation. The currency will serve as a medium of exchange; there exists a translated knowledge of prices, which is passed to the general public by market exchangers. This causes change to occur between fiat money (USD) and Bitcoin (Champagne, 2015), Fiat money is subject to taxation by the government. With large exchange eventually happening between the two currencies, governments will fear a loss of control of monetary flows and intervene. The last part of the dissertation will thus discuss possible government involvement: to what extent the establishment of a government regulating body is healthy for a monetary alternative, which is based on the idea that there is a need to avoid government interference.

## **Part IV**

### Government Involvement

Bitcoin has suddenly made it easy to move money around without people knowing about it, creating terrorist and tax concerns. There will be a lot of tension between knowing your customer, anti-money laundering and other regulations made for the traditional monetary system and the newly created system (Frisby, 2014) - most notably between the developed world, controlled by powerful financial institutions, and the developing world. Mexicans comprise about 55% of the foreign-born US-population. One of the highest contributors to the Mexican GDP is money sent from migrants living in the United States back home. In the last 5 years this has contributed to about 10% of the country's GDP (Frisby, 2014) - averaged around \$25 billion (Appendix 2). However, 7-10% of the money sent home is lost in the process; Bitcoin provides the necessary technology to do this at a much lower cost. As more people will adopt this new technology, it is going to be difficult for the US government to monitor and control that money exodus (Frisby, 2014). In the following the much opposed but yet necessary government involvement and their possible resulting regulation of the use of Bitcoin will be subject.

The Bitcoin community faces regulatory uncertainty, which had a negative effect on the emotional feeling of the market. The slightest news can send the value of the currency doing loops. China, a country with strict controls over capital flows in and out of the country, has implemented regulations that affect the use of Bitcoin negatively. Government involvement is already reality: the question is to what extent is it healthy?

Cubits CFO, Benedikt Manigold, believes that a certain degree of government involvement is essential for the maturing of Bitcoin. "Only if certain regulatory rules are established around the use of Bitcoin can and will Bitcoin become the mainstream technology it is able to be." (Manigold, 2015). He argues that Bitcoin's appeal is partly defined by its decentralized nature, through which an independence from government intervention and geopolitical tensions is guaranteed. However, are these aspects mostly around price and the amount of Bitcoin in circulation.

A restriction regarding cross-border flows of Bitcoin, or a central body that can issue or limit bitcoins, would destroy the very nature of Bitcoin. Regardless, regulation should be formulated targeting consumer protection and around payment services. (Manigold, 2015)

So far 24 countries including the US, Germany, India, China and Russia have implemented some sort of regulations regarding Bitcoin (Wright, 2015). Autocratic controlled states such as Russia and China are looking to ban the use of Crypto Currencies, as they promise an escape route for the hard savings trapped in banks, where the interest rate earned is too low to cover inflation. Media outlets in China have been discouraged from reporting about Bitcoin through a centralized regime of censorship (Vigna, Casey, 2015).

Companies and consumers dealing with Bitcoin need to be protected, in order for governments to feel comfortable with allowing a digital, alternative currency to co-exist with government-controlled fiat currencies. Therefore, Bitcoin companies have a collective responsibility to provide an answer to certain questions of licensing. A lot of these are around anti-money laundering and the segregation of client funds – so-called ring-fencing” (Manigold, 2015). Companies in the UK that deal with money digitally (eMoney license) for digital wallet services such as Skrill, need a government issued license. Such licenses for Bitcoin companies should be established as well – as their dealing with cash is a major part of the transaction business they are offering (Manigold, 2015).

Client fund segregation and full reporting on the provider side as a form of protection of consumers definitely would make sense and would not take away any of the positive characteristics of Bitcoin. Regulatory requirements that traditional FX platforms face should also be applied to exchange platforms, where Bitcoins are traded for fiat currencies (Manigold, 2015).

It is in the interest of a Bitcoin service provider to make sure that its users are not trying to conduct criminal activities but are willing to make use of a new empowering monetary alternative. Bitcoin service providers such as Cubits, require their customers to verify their identity via an ID card scan when opening an online wallet. An issue that needs to be addressed is the source of funds – where do customers get their Bitcoin from? However due to the pseudo-anonymity of the Bitcoin network, this is not always easy.

Government regulation is inevitable, yet bares a negative aspect, its cost. Manigold (2015) believes that “Capital requirements are often too high to be paid by startups, which is why many fear regulation could stifle innovation. Regulatory bodies and Bitcoin companies need to collaborate to find solutions to these issues. “

The importance of collaboration between regulatory bodies and Bitcoin companies has been highlighted in the past. The early days of Bitcoin saw hackers moving in. In 2013 someone hacked into the administrator account of the Bitcoin exchange Mt Gox, issuing sells orders for hundreds of thousands of fake bitcoins. The price was temporarily driven down to \$0.01 from \$1.50. Later that year Mt Gox collapsed as 774,000 bitcoins – worth \$409m, went missing. Until today there are no clues as to where they might be and due to regulatory and legal uncertainty authorities were not able to conduct subsequent investigation, leaving thousands of Bitcoin owners robbed of their belongings (Frisby, 2014).

Any real, centralized institution formed as a link between the private sector and the government would probably be highly controlled by the governments. Most definitely resulting in a reduction of the global nature of Bitcoin, making it a locally controlled system as local governments would want to exert control over Bitcoin in their respective geographies. Due to political and social economical differences existing worldwide, a globally unified stance of governments towards Bitcoin – or towards anything, really – seems highly unlikely (Manigold, 2015).

Bitcoin is the powerful tool that it is, through its decentralized nature. “Regulation, which can be somewhat government driven and therefore give a degree of comfort, as well as stakeholder protection are crucial and very important to the future of Bitcoin – central institutional control most definitely not.” (Manigold, 2015)

Governments do not need to fear a drastic loss of tax revenues with a higher frequency of the use of Bitcoin. The Crypto Currency is a monetary alternative which derives its value from its interdependency with fiat money. The currency will have significance for the e-commerce and remittance market. However, all other financial exchanges, from which the state receives most of its tax revenues, such as wage payments or retail sales, will still be handled through fiat money. Companies making use of Bitcoin as a form of payment in their e-commerce department will be responsible to give accountability for their operation, paying



taxes as usual. The Bitcoin protocol currently revolutionizes the remittance market. The payment system wins through its easy to use nature and essentially through lower transaction cost. As a result, who ever makes use of it has more money to spend in the pocket. This will foster local economic growth, as individuals have more money to spend on consumption within their respective place of residence, possibly resulting in higher goods and services tax.

## **Conclusion**

This dissertation has shown that the Crypto Currency namely Bitcoin, has many advantages for individuals that have until now been excluded from the economic growth that over the past century has been experienced by the industrialized nations. The irony of this point, put forward in this dissertation, is that these above-mentioned individuals were in fact the very same people that aided in their respective Nation's industrial success!

It is further put forward that Bitcoin in its current form will never, and should never, replace existing fiat currencies. This is proposed as the use of Bitcoin requires specialised technological knowledge and skill, which is not possessed by all, nor is it readily available and accessible. Bitcoin however, is designed to provide a platform for new forms of trade and a more equitable distribution of wealth. It is for this reason that Bitcoin is of significance for the remittance market.

Furthermore, this paper suggests that globalization has aided fast economic growth but accompanying this fast economic growth is the unjust distribution of wealth, ultimately leaving vast parts of the world underdeveloped. Additionally, another aspect of globalization is that technological advances have allowed for the ability to have information exchanged and disseminated widely and relatively quickly. This has allowed for people that would have otherwise remained ignorant and uniformed, to become aware of their current, disadvantageous situation. Another potential advantage of Bitcoin that is put forward in this paper is that there is a large migrant worker base, many of which support family members in countries different to the one in which they perform their work and receive their remuneration. The means available to these people by which money can be sent, is subject to strict control and red tape. This process is controlled by relatively few, key-player intermediaries. This results in unnecessary charges and delays in which money is "lost" in the

bureaucratic process. Bitcoin is an alternative to securely send money, without having to pay high fees, making it a highly attractive option for these people.

Moreover, Bitcoin has relevance for both, merchants and consumers that are participating in the e-commerce sphere. The use of Bitcoin will eventually serve as a way to bypass painful conversion rates, effectively raising profit margins and making online purchases cheaper. Money that has been acquired through hard work stays within the consumer's pocket rather than being absorbed by financial institutions and middleman.

Bitcoin and the idea of a Crypto Currency is fairly new and as a technology it is only 6 years old. As of now it is not ready to serve as a functioning monetary alternative, but this is not unexpected after a mere half-decade of implementation. However, if the Bitcoin enterprise as a whole gains collective value and acceptance, the likely outcome of this is it will serve as a competitor to traditional currencies and in some instances a replacement.

Companies that deal with Bitcoin and build payment services and related gateways need to interact with traditional financial institutions. This is said as they face a number of requirements around knowing who their customers are and the prevention of money laundering. These systems of control are increasingly being adopted within the Bitcoin landscape, leaving it as a less obscure and more traceable form of currency. The trust gained due to this aspect will reduce occurrences of malevolence that have in the past hurt Bitcoin's reputation, and price (Manigold, 2015). Bitcoin's success will be defined by its early adopters, namely the libertarian community who worked on its invention and the companies that realized it's potential.

Bitcoin is just the beginning of a change in the monetary system that is in place today. For the near future anyway, cash is here to stay. However, eventually cash will become a souvenir of the past as people are looking for more convenient methods of payment. According to Gartner, the technological research institution, in 2012 consumer spending on mobile technologies accounted for almost half of all technology spending, adding up to a £511bn. Recently MasterCard released a survey which suggests some countries are within striking distance of a cashless society with only 7% of the value of consumer transactions taking place in cash in Belgium, 8% in France and 10% in Canada (Martin, 2015). As of now the market is fragmented, made of many different types of business including banks, mobile

operators and payments providers all developing their own resolution. What is needed is a consolidated payments method that businesses can invest in and consumers can embrace. Bitcoin has all it takes to be that payment system (Martin, 2015).

Undoubtedly Bitcoin has the potential to cause great changes in the way money is sent and received. Its importance for the world of money and banking are tremendous. It is the outcome of an evolution that has successfully tried to establish an alternative to the existing money and banking system. A system which has been established by governments, in cooperation with powerful financial institutions, that has remained largely unchanged within the last century. Even if Bitcoin as a currency fails, its core idea of a decentralized peer-to-peer payment system that bypasses third parties will most likely endure. There is a demand for Crypto Currencies to replace and/or compliment hard currency due to subjective advantages which arise from its various traits namely, cryptographic trust, anonymity, and a decentralized system of clearance, a defined rate of growth, built in inflation and the low transaction fees. All these are inherent to the Bitcoin system (Champagne, 2015).

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#### **Picture and Table Reference List:**

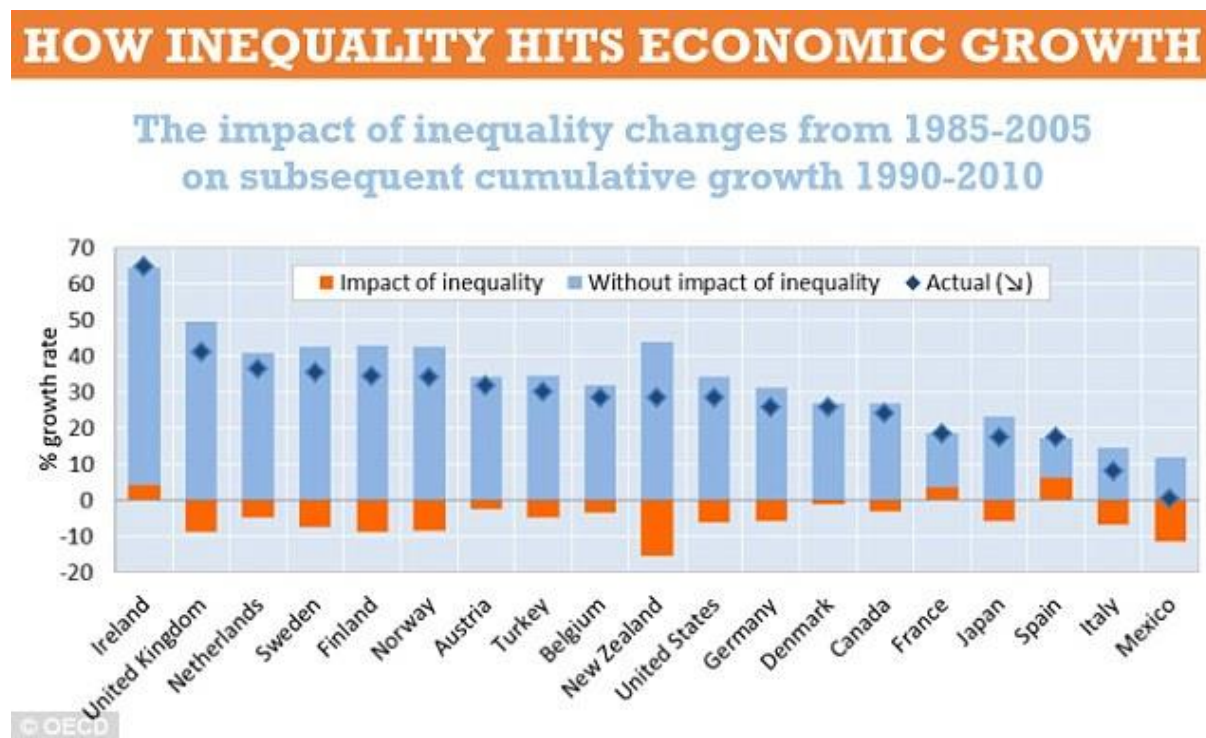
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## Appendix

Appendix Graph 1 shows how inequality affects economic growth

(<http://www.dailymail.co.uk/>)



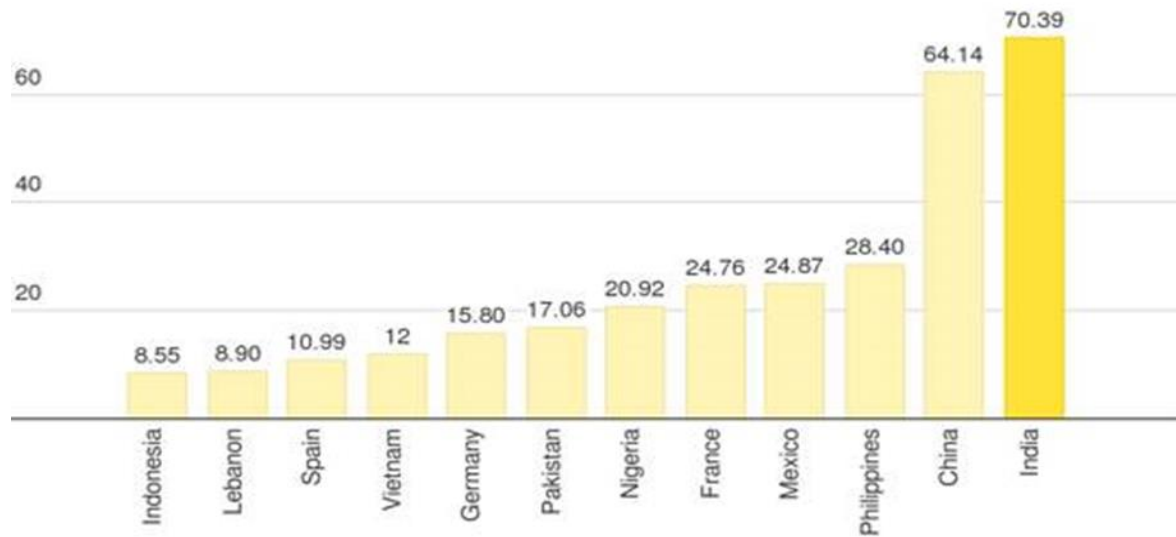
<http://www.dailymail.co.uk>. (2014). Growing gap between rich and poor in Britain over two decades means the economy is 9% smaller that it could be [ONLINE]. Available at: <http://www.dailymail.co.uk/news/article-2866675/Growing-gap-rich-poor-Britain-two-decades-means-economy-9-smaller.html> [Accessed 30 July 15]

Appendix Graph 2 shows Relative Remittances – Money sent home in billions of dollars in 2014 (<http://www.worldbank.org/>)



## Relative Remittances

Money sent home in billions of dollars in 2014

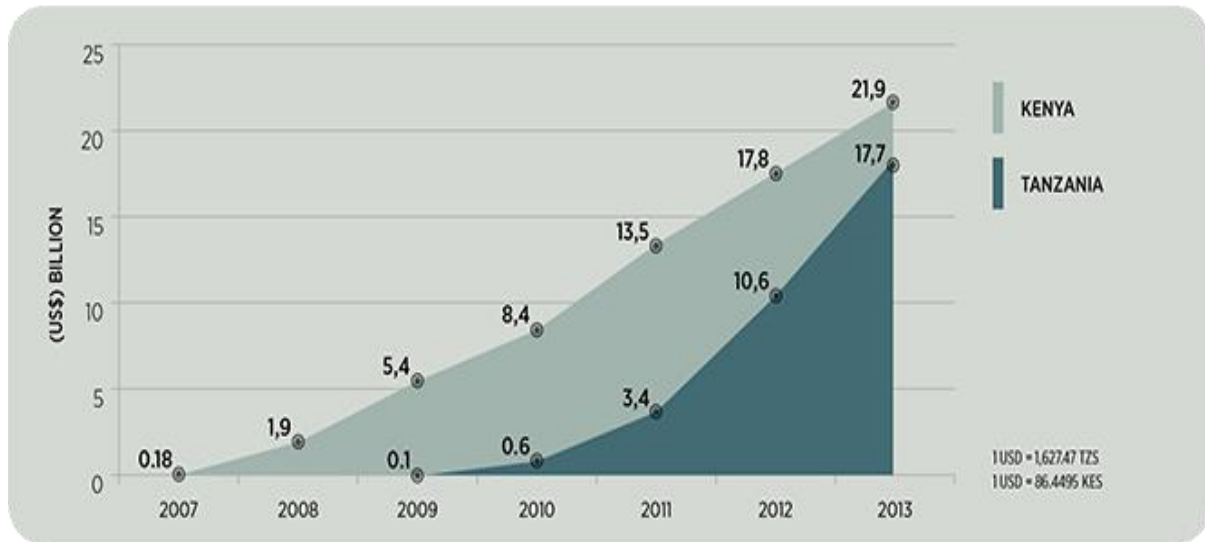


Source: World Bank

<http://blogs.wsj.com/>. (2014). India Wins the Remittance Race Again [ONLINE]. Available at: <http://blogs.wsj.com/indiarealtime/2015/04/15/india-wins-the-remittance-race-again/?mod=e2tw>[Accessed 30 July 15]

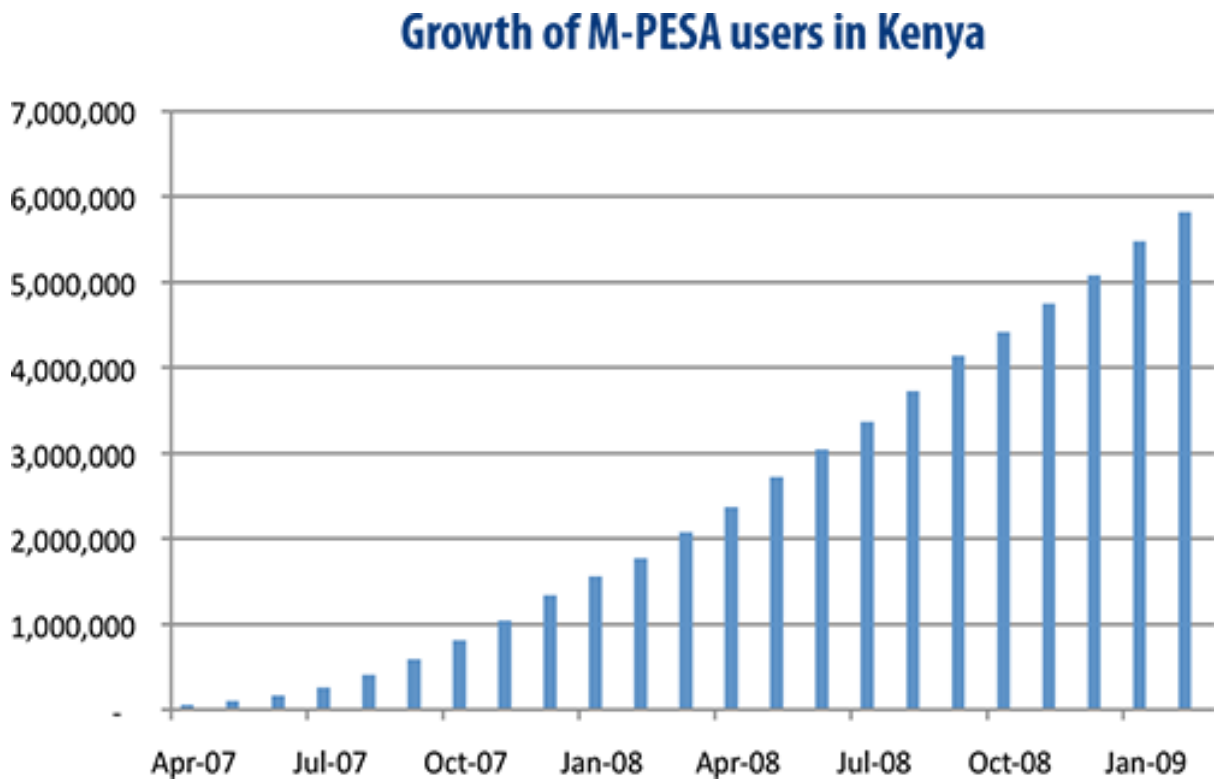
**Appendix Graph 3** shows the yearly transaction value of mobile payments in Tanzania and Kenya from 2007-2013 (<http://blog.unibulmerchantservices.com/>)

### COMPARING MOBILE MONEY IN TANZANIA AND KENYA: YEARLY TRANSACTION VALUE



<http://blog.unibulmerchantservices.com/>. Tanzanians Had Enough of Banks Not Doing Their Job. [ONLINE]. Available at: <http://blog.unibulmerchantservices.com/tag/m-pesa/> [Accessed 30 July 15]

**Appendix Graph 4** shows the growth of M-Pesa users in Kenia from 2007-2009 (<http://blog.unibulmerchantservices.com/>)



<http://blog.unibulmerchantservices.com/>. Tanzanians Had Enough of Banks Not Doing Their Job. [ONLINE]. Available at: <http://blog.unibulmerchantservices.com/tag/m-pesa/> [Accessed 30 July 15]

## Appendix 5 - Cubits CFO Benedikt Manigold Interview

**Leon Wankum:** *Bitcoin's short history has been defined by peaks and troughs. The news coverage has been both, extremely positive and negative. Consequently, this has had an effect on both the public perception of bitcoin and its valuation. How, in your opinion, can the private sector contribute towards stabilising bitcoin's exchange rate and reducing price volatility?*

**Benedikt Manigold:** As Bitcoin's price is only driven by supply and demand, price volatility has definitely been an issue over past years where volumes have been lower and fewer large transactions were able to cause larger movements in price. Post the spike in price in late 2013/early 2014, the price has come down gradually. In 2015, Bitcoin has maintained quite a stable price level.

When looking at further stabilisation of the price, there are three main factors that should be considered. The private sector's actions and services contribute to all of them.

First of all, the growth of the Bitcoin ecosystem in itself presents a stabilising factor. As more information and knowledge on Bitcoin spreads, and as more people are effectively part of the system, the price volatility is reduced. Education is an important aspect, as understanding the dynamics and use cases of Bitcoin limits particular behaviors of quick buying and selling that have unsettled the price in the past. The responsibility for the education of the market lies predominantly with companies trying to build services around the Bitcoin technology – the private sector. Customer acquisition, media and political work and especially provision of trustworthy services all contribute to the growth of the user community and the education of people.

The second factor that will limit the price volatility in the future is the dispersion of services. Bitcoin, via the services provided by the private sector, has already moved slightly away from being perceived as speculative asset to a transaction medium, a store of value and a payment method. The more these services evolve, and the

more liquid Bitcoin becomes due to smaller, more frequent use, the more stable the price will become. Firms in the space are developing a wealth of viable business models, all of which will help A) to diversify the use cases of Bitcoin and B) to shift the public's focus from price of Bitcoin to its many uses.

The third and last point I want to highlight is are policies of KYC and Anti-Money laundering. As companies that deal with Bitcoin and build payment services and gateways around them need to interact with traditional financial institutions, they face a number of requirements around knowing who their customers are and fighting money laundering. These requirements are increasingly adopted within the Bitcoin landscape, leaving it less obscure and more trackable. The trust gained due to this aspect will reduce occurrences of malevolence, that have hurt Bitcoin's reputation – and price – in the past.

**Leon Wankum:** *Security is a major obstacle for the greater acceptance of the currency. The greatest advantages of Crypto Currencies are its easy nature of use, instantaneous delivery and anonymity – however, the latter is also its greatest weakness, as well as the digital storage. For a long term success of the currency it is fundamentally important for security measures to be implemented effectively to ensure that business and private users are not put at risk through its use (Wright, 2015). How in particular could these look?*

**Benedikt Manigold:** Correct – we are witnessing a certain reluctance of merchants and consumers to try out Bitcoin or use it as a serious payment method alongside fiat currencies. This is mainly due to negative press that Bitcoin has attracted over its earliest days, and hasn't been able to shrug off completely until now. In people's heads, Bitcoin is often associated with hackers, obscure online marketplaces and illegal purchases, or money laundering. As Bitcoin is getting more attention though, incidents have been reducing and controls and security has been increasing – to our all benefit.

There are a couple of security aspects that can help the perception and open up Bitcoin to more and more people.

First: The storage aspect. Customers and merchants want to know their funds safe. This means, both in terms of cyber crime protection and in terms of the institution guaranteeing the funds. In the former, there is a lot that is happening. Many wallet services are implementing safe, offline storages called cold wallets. These are not connected to the Internet and can therefore guarantee safety of funds. The hot wallet, which is online, is then filled (as required to service transactions) from the cold wallet. At some firms, such as Cubits, this process needs the sign-off from more than once executive as an extra layer of security. It has become much harder for hackers to access Bitcoin funds (and one shouldn't forget that traditional banks are not spotless in hacker defense, either).

The second aspect is the trust placed in the companies that hold your Bitcoin – such as Cubits. For a customer to trust a company with his or her money, he or she usually demands a certain guarantee of funds. What if the company goes bankrupt? Who will reimburse me? In the Bitcoin world, this guarantee can probably only come via collaboration with government bodies or insurance companies – the latter, however, are not very likely to insure these risks as of today. But as services become more established, insurers are starting to build products around Bitcoin that could prove very helpful.

When it comes to the actual transactions within Bitcoin, these are much safer than any traditional transfer processes. Cryptographically sealed, one can even embed collaterals or conditions upon which payments can be fulfilled. All transactions are on file on the block chain forever, and therefore confirmable by any member of the system.

So, in conclusion, added security should be in the realm of fund safety and fund guarantees, as these are the currencies weak spots.

**Leon Wankum:** *Lastly I would like to address regulatory uncertainty, which surely had a negative effect on the emotional feeling of the market. The slightest news can send the value of the currency doing loops. Especially China, a country with strict controls over capital flows in and out of the country, has implemented regulations that affect the use of bitcoin negatively. Could you elaborate on what regulations you believe government should implement on the use of bitcoin. To what extent is government involvement healthy?*

**Benedikt Manigold:** I am of the firm belief that a certain degree of government involvement is essential for the maturing of Bitcoin. Only if certain regulatory rules are established around the use of Bitcoin can and will Bitcoin become the mainstream technology it is able to be.

Part of the appeal of Bitcoin is its decentralised nature, the independence from government intervention and geopolitical tensions. But these aspects are mostly around price and the amount of Bitcoin in circulation. There should not be a restriction of cross-border Bitcoin flows, or a central body that can issue or limit bitcoins, as this would destroy the very nature of Bitcoin. However, regulation should be formulated around consumer protection and around payment services.

For governments to be comfortable with allowing a digital, alternative currency to co-exist with government-controlled fiat currencies, consumers and companies dealing with Bitcoin need to be protected. For that reason, Bitcoin companies should have to answer to certain licensing parameters. A lot of these are around anti-money laundering and the segregation of client funds – so-called ring-fencing. In the UK, there are licenses for companies that deal with money digitally (eMoney license) for digital wallet services such as Skrill. These would make sense for Bitcoin companies as well – as their dealing with cash is important part of the transaction business they are offering.

Protection of consumers in form of client fund segregation and full reporting on the provider side definitely would make sense, and would not diminish any of the positive characteristics of Bitcoin.

Exchange platforms, where Bitcoins are traded for fiat currencies, should also face the same regulatory requirements as traditional FX platforms. One issue that needs to be addressed is the source of funds – where do customers get their Bitcoin from? Due to the pseudo-anonymity of the Bitcoin network, this is not always easy.

The negative aspect of regulation, however, is its cost. Capital requirements are often too high to be paid by startups, which is why many fear regulation could stifle

innovation. Regulatory bodies and Bitcoin companies need to collaborate to find solutions to these issues.

**Leon Wankum:** *Do you believe that with a successful establishment of either bitcoin or a successive Crypto Currency as a monetary alternative and a payment system, there will be a need for an institution to be formed as a link between the private sector and the government? If so, how could such an institution look?*

**Benedikt Manigold:** I believe that regulation as discussed above will suffice to form a link between government and the private sector. Any real, centralized institution to sit between government and the private sector would most definitely be highly controlled by the governments, reducing the global nature of Bitcoin and making it a locally controlled system as local governments would want to exert control over Bitcoin in their respective geographies. A globally unified stance of governments towards Bitcoin – or towards anything, really – seems highly unlikely to say the least.

The decentralised nature of Bitcoin makes it the powerful tool that it is. Regulation, which can be somewhat government driven and therefore give a degree of comfort, as well as stakeholder protection are crucial and very important to the future of Bitcoin – central institutional control most definitely not.