

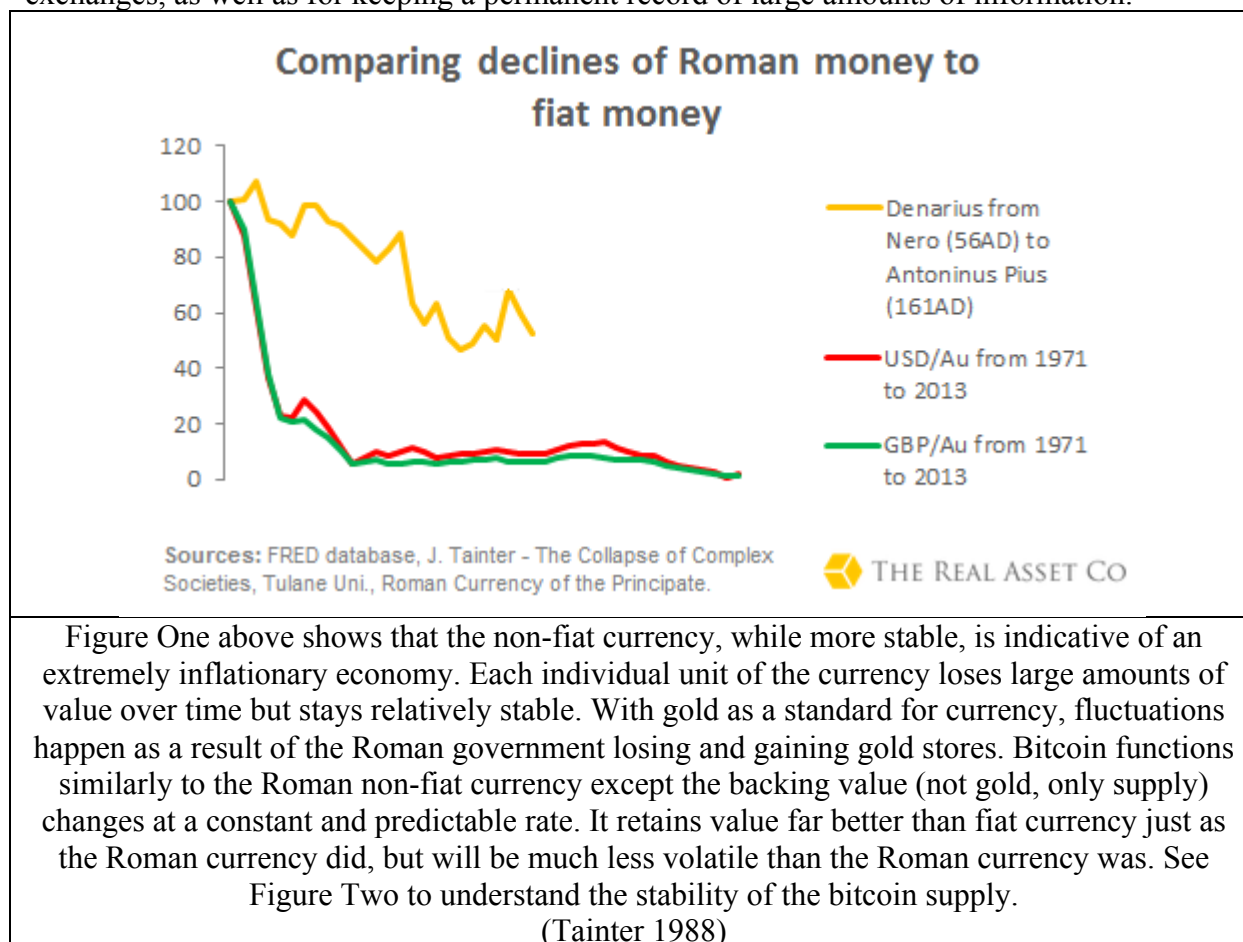
Yusuf Sheth
HON 301
3/24/2014

Bitcoin as the Bridge to the Future

The development of mankind has been powered through diversification and innovation, the creation of new services and goods, and the discoveries of new technologies. However, none of this would be supportable without the use of currency, a means of monetary exchange of value. By allowing humans to translate their specialized skills into discrete goods and services, the existence of a medium of exchange of commerce has become the bridge between an archaic, divided society and a cooperating, globalized earth. As the human race and new technology progresses, unprecedented challenges present themselves in how humans deal with the issue of exchange of value. The potential answer to the dilemmas of the world can be found in the advent of electronic currency with the futuristic, unfamiliar and sometimes mystifying bitcoin. As bitcoin grows in recognition and usage, humanity will find that it is at the cusp of a fiscal revolution. Due to the unique properties of electronic currency and attributes specific to the bitcoin, global commercial and humanitarian issues such as the need for a deflationary and more stable currency, a safer right to privacy of the consumer, and access to a better quality of life for the people of the world will be solved and the human race will be able to progress unfettered by the problems of a divided world.

The first use of currency by humans has allowed them to reach the point that they are at today. Before currency existed, Paleolithic bands of humans dating as far back as 10,000 BC traded commodities between themselves, exchanging assets such as food and tools as well as mates (Scarre 2009). Unless the traders had valuable items in hand (e.g. animal skins, sharp rocks), the trade would be impossible to complete because there was no guarantee that both traders would receive an equal amount of value in return. The barter method was used to ensure that all parties involved were trading immediately and instantaneously for what they believed to be equal value. This method of exchange persisted even into the Mesolithic and Neolithic eras, many thousands of years later. The Neolithic era which persisted from circa 7500 BC to 3500 BC also saw the rise of specialization in production in the way of trinkets, elaborate tools and foods, et cetera (Cameron 1993). This was largely a luxury of larger tribes that allowed certain members to devote their lives to a single occupation, such as agriculture and pottery. As tribes grew larger, arbitrating and agreeing upon larger trades became more cumbersome. According to R. and G. Davies in their work *History of Money*, it was in this era that humans began using cattle as a form of currency (R. Davies, 2012). This was the first notable use of non-barter trades, as the cattle were designed to retain value that could later be used in any other trade – essentially a perfectly liquidating asset, relative to the time. The Bronze and Iron ages saw the introduction of “proper” metal currency in the form of coins, a necessity that became apparent in huge transactions with governments and empires such as the Roman Empire, and specifically by the work of Alexander the Great. Quintus Rufus noted in his work *Life and Exploits of Alexander the Great* that while Sumer and other Mesopotamian city-states were the first to mint these coins, it was Alexander who by virtue of the huge federation he had built, saw the need to create widespread use of the metal tokens and accelerated regnant use of them (Rufus 1858). Currency branched into different forms with the banknotes of the Tang Dynasty in the 9th century, marking the beginning of the use of credit on an object (in the case of the Tang Dynasty, paper)

that otherwise had no inherent value (Benn 2002). With the advent of the internet and other digital forms of recording value, forms of monetary transfer like bank deposits, payment processors, and digital currencies such as the bitcoin. Electronic transfers of money quickly became the predominant way to trade due to the ease of long distance and high volume exchanges, as well as for keeping a permanent record of large amounts of information.



To understand why the bitcoin is the next logical step in the progression of currency, it is important to understand what it is and how it functions. Since the bitcoin is an electronic assignment of value, it has no tangible presence – only a code that signifies its digital existence. This code can be transferred between people who own a bitcoin “wallet.” This wallet, a type of software used to store codes that can be run on most platforms, safeguards the corresponding codes for each bitcoin. This means that if a person writes down a code for a bitcoin and hands the code to another person, the latter can enter into his own wallet and initiate a transfer (although this method of transfer is seldom done, as it is simply adding another step to the transfer process). With traditional currency, such as a dollar, it is impossible to “spend twice” because the dollar cannot exist in two places at once. The codes cannot be double-spent because there is a public ledger for each individual unit of bitcoin. This ledger transparently displays every transaction that took place with it through bitcoin addresses so it remains for the most part anonymous. These codes are generated within the economy itself. Every time a transfer of the coins is initiated, third-party arbitrating computer systems will verify the transaction and add to the block-chain (a process called mining, for which the third-parties will typically be compensated

some small amount of bitcoin). These computers are owned by a variety of people ranging from independent consumers to large corporations and are often specially designed to mine the coins efficiently. Bitcoins kept on a wallet can be used to pay through any medium imaginable as long as they have a public wallet, from brick-and-mortar stores to online back-alley sites such as the Silk Road and anything in between. There are multiple varieties of bitcoin that are essentially independent currencies, though they can be traded between themselves in the same way that a US dollar can be traded to a Euro using exchange rates that use the current values of each currency. Some of these currencies include namecoin, litecoin, dogecoin, and mastercoin among thousands of others. New alternative forms of cryptocurrency (the official classification of bitcoin) sprout often but are given little credence unless their native economies grow enough to trade with other cryptocurrencies.

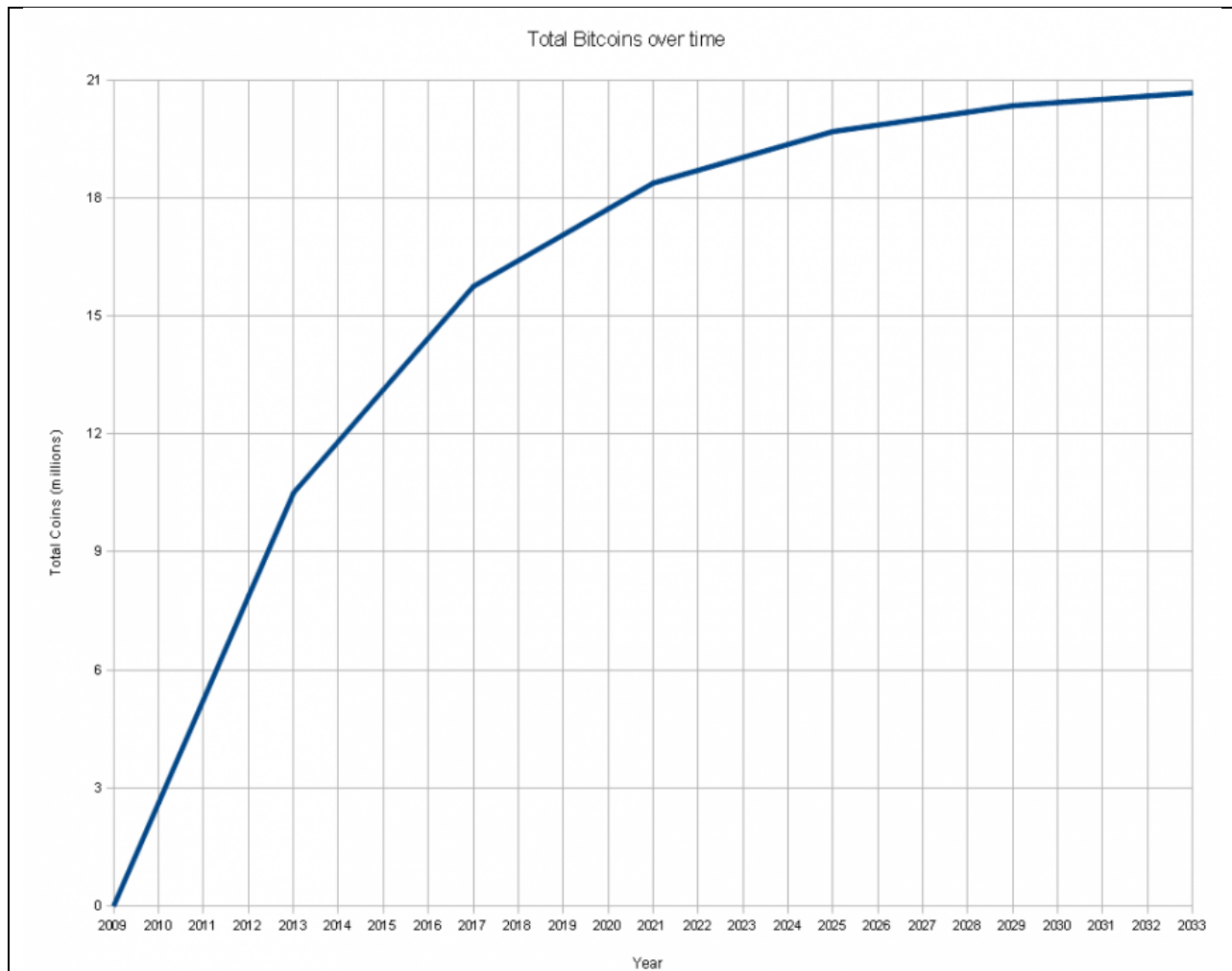


Figure Two illustrates how the production of bitcoin will taper off, resulting in a deflationary economy. With each mining process, a decreasing amount of bitcoin is created, eventually reaching a relatively stationary amount and holding flat. (Kaufman 2014)

As a peer-to-peer method of transfer of value, bitcoin has many advantages unique to its cryptocurrency form and to its very divergent modus operandi. Bitcoin, above all, is not fiat money. Fiat money, according to Gregory Mankiw in his work *Principles of Economics*, is

“intrinsically valueless money used as money because of government decree.” (Mankiw 2014). Bitcoin in comparison is a currency whose value is dictated by the market, not the state. Bitcoin cannot be taxed and limited by the government to corral its values to a purpose and so in the long run is theoretically a much better store of value than a fiat currency such as the euro or the dollar. Fiat currency, on the contrary, can be molded by monetary policy to serve a function of the government. Fiat currency is an inflationary tool; it is a store of a value such that a single dollar is designed to lose value over time. This is not a byproduct of the system of fiat currency, but rather a central feature. Through a system called quantitative easing, a single example of the tools a government can use to shape fiat currency, central banks that deal in fiat currency can artificially increase the amount of money in circulation (and effectively decrease the value of each individual unit) by purchasing a calculated amount of financial assets. In a publication by Daniel Thornton, Vice President and Economic Adviser of the Federal Reserve of St. Louis, pointed out that expansionary monetary policy can lead to a surfeit of economic misfortunes such as uncharacteristically slow employment growth rate, risk of severe over-inflation due to lag in effect of the policy, and inability to pinpoint the reason for slowed inflation that prompted the monetary policy (Thornton 2010). Quantitative easing is impossible with bitcoin because once a hypothetical bitcoin bank buys the financial assets with bitcoin, the bitcoins transferred in the process are not created as they are in a fiat system but instead are just relocated. The public ledger illustrates this point well – each bitcoin remains accounted for. In this vein of thinking, it is virtually impossible to for a large economic power with a large amount of bitcoin holdings to use large-scale expansionary monetary policy and crash the bitcoin with inflation.

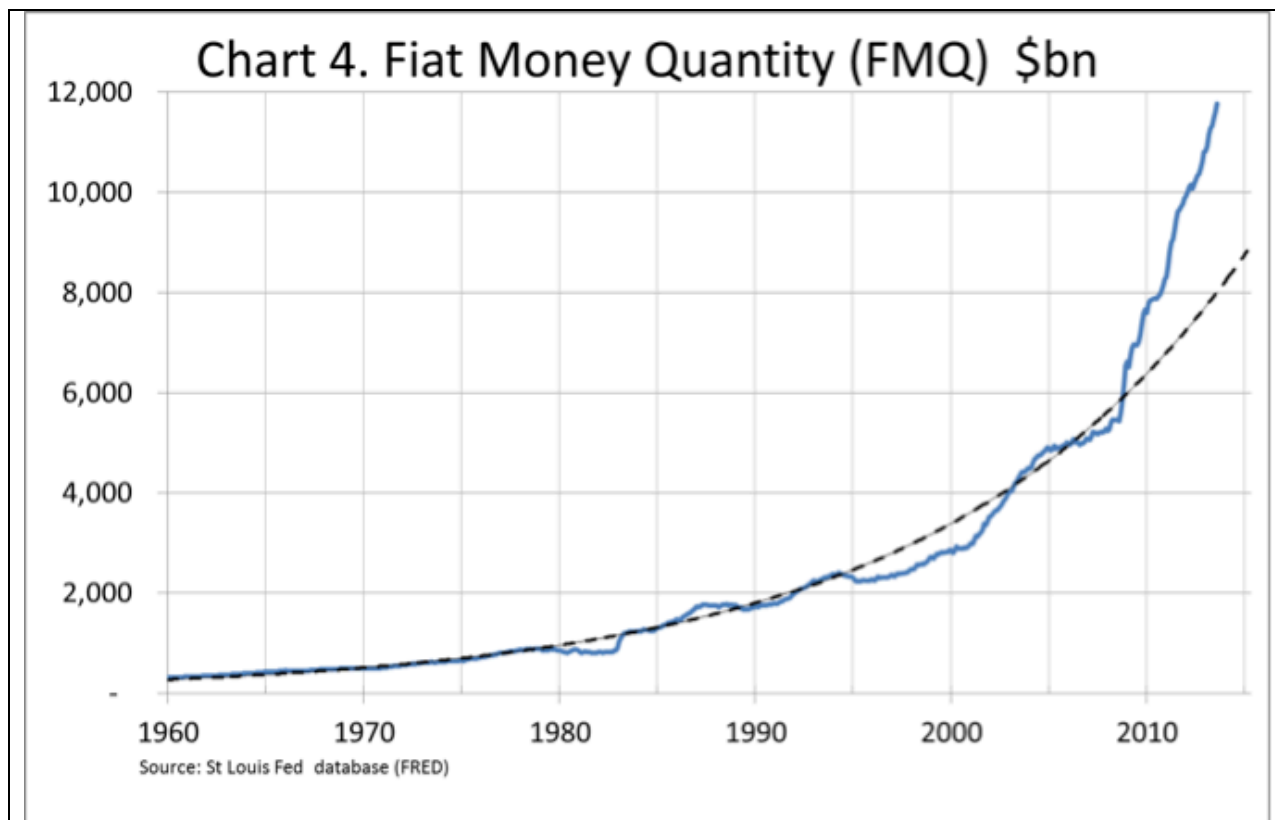
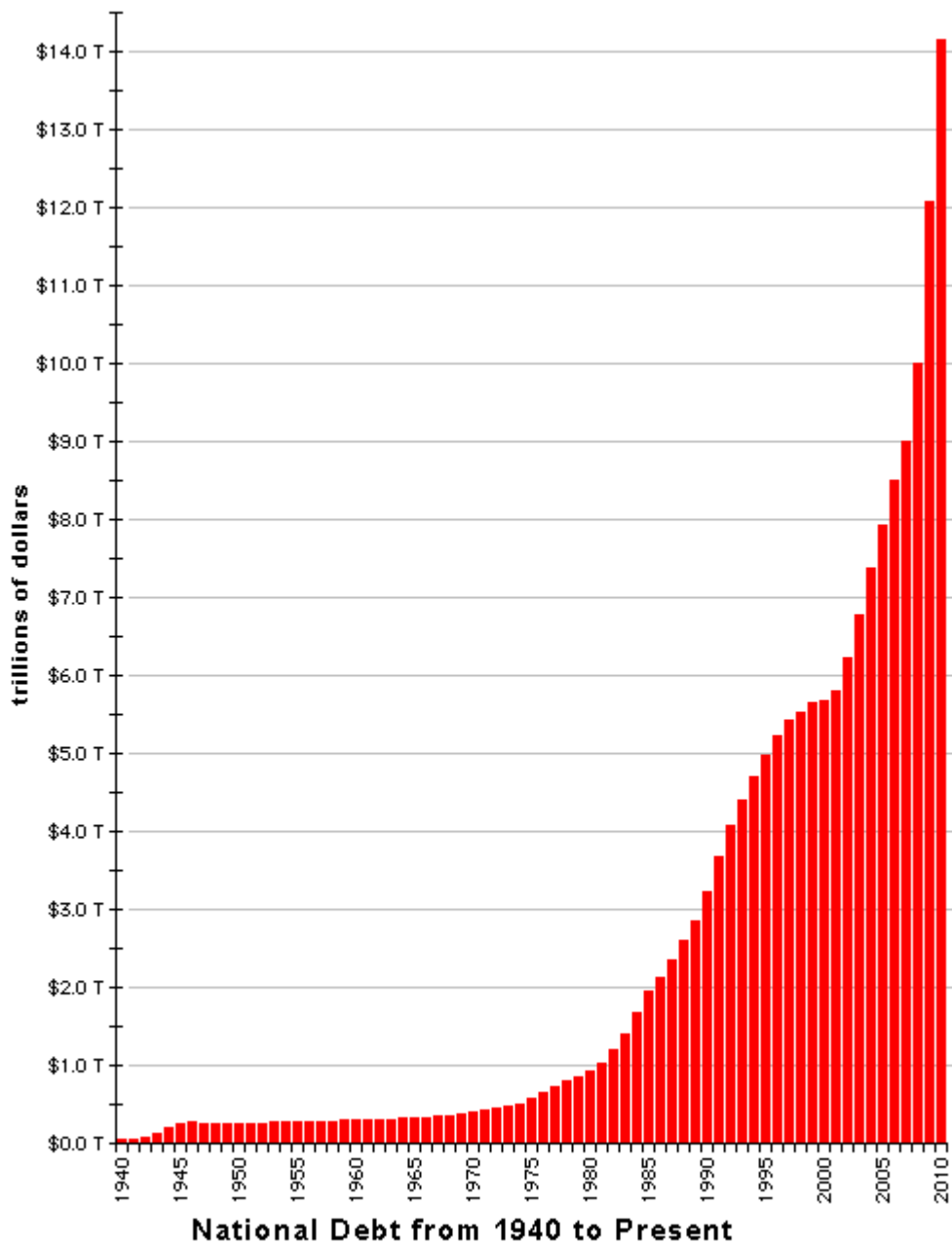


Figure Three is another demonstration of the deflationary tendencies of the fiat currency. Over time, the government will continually implement expansionary monetary policy to keep the economy at an “optimal” level of inflation, which over time results in a huge amount of available and less valuable currency. (Macleod 2010)

Before fiat currency, gold was used by nations as a base assignment of wealth. The dollar before the Nixon era was based on the amount of gold the US government had in its stores. In the Bretton-Woods system that Nixon had ended, countries settled their accounts internationally in US dollars which were officially set to be able to liquidated to a fixed amount of gold; the benefit of this system was that countries would not be able to use expansion or contraction of their own currencies and monetary supplies as tools to gouge other countries’ economies, as Sandra Ghizoni wrote in her publication “Establishment of the Bretton-Woods system.” (Ghizoni 2014). With the bitcoin, Ghizoni mentions, this competitive currency warfare would not even be possible due to the fact that bitcoin’s value is not determined by anything except supply and demand laws. Historically, currencies that have failed such as the Zimbabwean dollar and the German mark immediately before Hitler’s Third Reich were ultimately ruined by hyper-inflation, an impossibility in the world of bitcoin. The base of bitcoin’s value and the fact that it cannot be influenced to the whim of a government or large business are two of the most important characteristics of the cryptocurrency that identify it as the next logical step in the progression of mankind’s currency.



Source: U.S. National Debt Clock
http://www.brillig.com/debt_clock/

Figure Four above depicts the change in the US national debt following Nixon's Gold Shock in 1971. When the US stopped using a value base (which was gold) to support the currency and switched to fiat money, the US dollar gained more and more of its value from other countries essentially loaning the US money. With bitcoin, currency would not need to gain money through borrowed credit but would stand independent and derive value from supply and demand. (Looy 2011)

Bitcoin offers many advantages to the world's poorest populations that fiat money and a globally divided world could never achieve. The first, most pronounced barrier is giving the poorest people of the world access to the cryptocurrency economy. However, due to a strange sociological trend, this is remarkably easy to overcome. Surprisingly, poor countries that have lagged behind in adoption of desktop computers and other typical infrastructural commodities have in the past decade heavily embraced the use of mobile communication in the form of cell phones. In a study by the United Nations, the number of phone subscriptions has reached almost the amount of people on the planet, even outstripping the number of people who have access to plumbing and toilets (United Nations, Manoocher 2013). This report also expounded upon the fact that the population in developing countries with access to cell phones is more than twice the population that has access to banks. Understandably, this is crucial to the use of bitcoin in these countries as the cryptocurrency is accessible on any network-connected technology, including cell phones. As the populations gain access to a larger supply of a bitcoin economy that is not obfuscated by large banks and intimidatingly steep interest rates like fiat money is, start-up capital will be easier to come by and the businesses of these nations will have lower entry costs into the market. Consequently, the growth rate of these developing nations will theoretically at least match those of the contemporary industrialised nations, perhaps even exceeding them due to a vacuum in the market. The internationally-floating cryptocurrency also enables financial aid sent from an industrialised nation such as the US to a relatively less well-off country such as Mexico by a worker to his or her family would not be shackled by the confining fees and taxes that can sometimes run as high as 20% of the sent funds (Fong 2013). With bitcoin, a wallet can be opened in one country, deposited into, and opened in another country with no extra barriers to the transfer. Even transferring between wallets is just as simple as if a few US dollars were being exchanged in person by handing the money over if the two parties were in a room together except bitcoin is arguably easier – it's a much higher security transfer that's publicly recorded. This ease of transfer will greatly encourage the development of countries that don't have large GDP production normally. In modern fiat currency, this would hurt the country in which the immigrant was working in and sending money from due to the fact that the currency was essentially being invested in a different economy than the one it was generated in. With bitcoin, homogenous currency eliminates the danger of price gouging. A person who works in the US and earns \$10 would have much more purchasing power in Mexico where the price index and cost of living is much lower than in the US due to differences in the strength of the fiat currency. They would be incentivized to send the money to relatives in Mexico and thus invest it in a foreign market, which would not benefit the home country, the US. With bitcoin however, as the currency homogenises so too will the price index. The problem of price gouging will disappear and the US will have no incentive to put a firm stop to workers sending money to another country. On the same note, workers would have less of an incentive to work in a different country and would find just as much utility working in their native country and reinvesting in their own markets. This benefits all parties involved and ensures that there is no uneven distribution of reinvestment into economies, encouraging a constant growth. These are among the few advantages that the poorest populations of the world will find in bitcoin and are ones that would never be available to them through fiat currency, the current global standard.

Estimated number of mobile-cellular subscriptions, Internet users and fixed-telephone subscriptions, 2005-2013 (Billions)

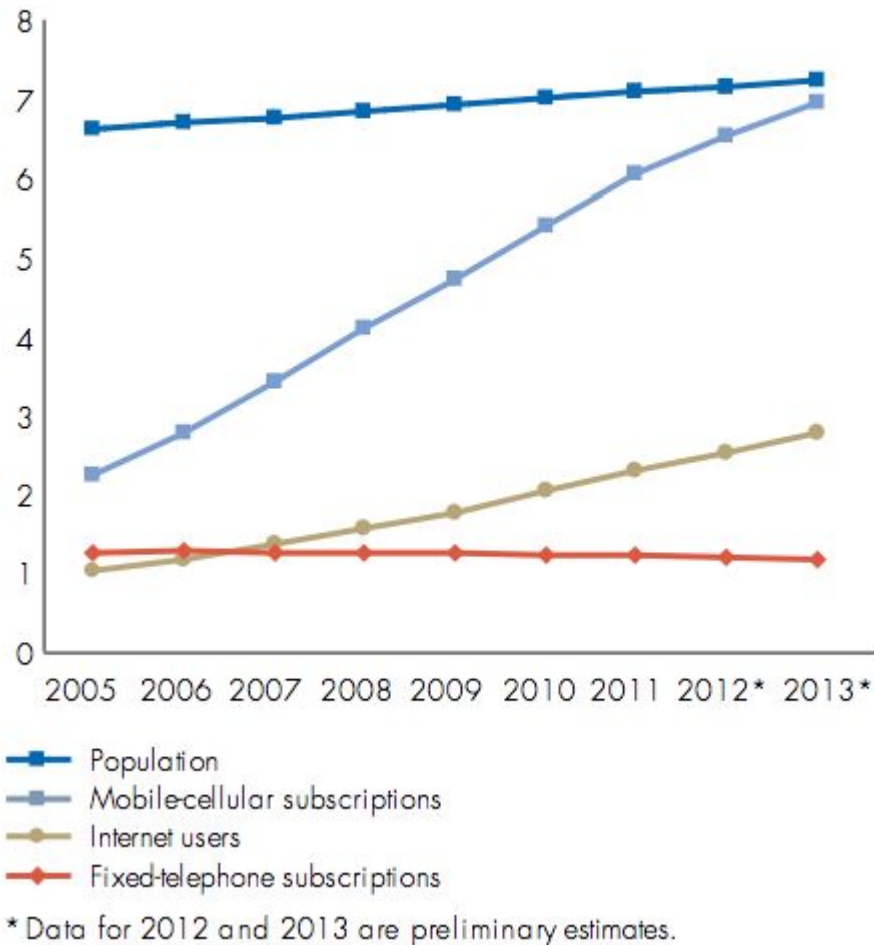


Figure Five shows the estimated amounts of cell subscriptions versus population. The most important relationship to note here is that on average, almost every single person in the world by the end of 2013 should have a cell phone subscription. This means universal access to a bitcoin wallet and to the bitcoin economy. (Bildener 2011)

Bitcoin is an avenue to help retain the rights and privacies of its users and help avoid illicit action just as much as it is a tool to help the poor. Among the most arresting problems with privacy is the payment card industry consisting of credit banks, debit banks, and many other varieties. Bitcoin, due to its unique properties, threatens to bypass the entire industry. According to the Payment Card Industry Security Standards Council, the payment card industry in the United States alone is worth over 200 billion dollars, with the total transaction amounts through the payment industry totaling to over two trillion (Johnson 2013). With each of the transactions made, a very traceable history is recorded for each consumer, detailing what was purchased, when it was purchased, what the finances of the consumer's account are, and what their payment history is like. This data is rarely entirely secured by the company. In June of 2011, Citigroup

inadvertently leaked approximately 210,000 accounts and all the respective information in them to public domain, causing a massive debacle in ensuring that funds were not stolen and information was not used illegally (Greenberg 2011). Even without leaks, it's often suggested that there are backdoors into the information that allow the personal and financial information to be shared. Bsafe, a security software used to encrypt many credit cards and other top-security financial information, was shown to have a backdoor in the coding for the government to access acting through the US National Security Agency (Menn 2013). The implications of this include the fact that using a credit card as payment (as most of the industrialized world does) assumes a forfeiture of privacy both to government through backdoors and the NSA and potentially to other people in the form of data breaches. Cryptocurrencies such as the bitcoin circumvent the issues that are present with payment card industries (PCI). The PCI, a for-profit industry that maintains records to help their customers better, builds a store of information for each of its users. All of this information is very specific to each user and contains large amounts of data that the consumers are often not comfortable with having compiled. Cryptocurrencies do not share in this problem. The most important characteristic of bitcoin is the full transparency of the transactions. Each bitcoin is verified in a public ledger as it moves from one bitcoin wallet to another and every public ledger is perpetually accessible by anyone. This means concealed payments cannot be made; though this seems counterintuitive for privacy it is important to note that the transactions only record the address of the bitcoin wallets, not the users. The most encouraged practice to safeguard privacy of the user is to use a new bitcoin wallet address for each purchase. This is a very easy precautionary step to take as wallets are free and instantaneous to create. The only way to develop an understanding of a person's transaction history with bitcoin is to compile a study on the individual bitcoins in each transaction and to see what the pattern of purchases are to identify the consumer by following a single wallet over many transactions. However, through the use of multiple wallets and basic safety measures, this threat is entirely eliminated. The counterargument to bitcoin's privacy raises the issue of transparency of purchases. With the use of super computers and a fleet of accountants, a Forbes editorialist wrote, any amount of workable data especially the vast amount of public bitcoin ledgers can be parsed to gain an identity for each buyer and seller (Keng 2013). Forbes writer Keng argues that this Big Brotheresque reality is imminent because the US government has a large incentive to make sure that every transfer to and from bitcoin is taxed. However, as it stands right now, this is not an ability of any government as the only way to restrict the use of bitcoin is to limit internet access. This is hopefully an impossibility as many groups and councils have established this as a right, such as the UN in the Special Rapporteur conference in May of 2011 (Wilson 2011). In order for bitcoin to assume a position as a helping hand to the rest of the world, it must first be recognized as a powerful tool to help those with their rights suppressed.

With the advent and adoption of bitcoin, the world is quickly sliding into a (futuristic artistry?) that humanity could never have predicted. Digital currency, space-age technologies, and breakthroughs of every type (litter?) the human condition. As bitcoin and other neoteric technologies and pick up steam, humanity will find itself less preoccupied with the smaller problems that were vestigial of older tech and the problems of eras already past, and will find itself increasingly occupied with the larger issues and questions that have been shelved until it can resolve its internal conflicts. Bitcoin can be part of the solution that bridges a world where political and economic differences divide the human and a world where efforts and lives can be focused in a more holistic sense. The adoption of bitcoin and other groundbreaking technology might be the key to a golden age.

Very strong paper. Bravo! The inclusion of graphs was also very informative. A good primer for non-eco majors interested in the Bitcoin buzz.

Your advocacy of Bitcoin is palpable, and the paper has a Libertarian enthusiasm that is almost infectious. But before I go out and invest, I return to a couple of issues your paper did not fully address.

The first is the general security of the Internet itself. Recent revelations about the HeartBleed bug indicate that SSL has been compromised on over half of the servers in the world. While this problem is not exclusively Bitcoin's, it is more vulnerable because it is an Internet-only based currency. Coupled with the bizarre behavior of Mt. Gox, the leading Bitcoin currency dealer, in the loss of 750,000 Bitcoins, it is hard to see much investor confidence in Bitcoin as a reliable store of value in the near term.

The second problem is one that economist Paul Krugman has alluded to: hoarding. Since the Bitcoin supply is finite, what prevents powerful investors from trying to buy up the available Bitcoins and drive up the price, as they have done with other items of value in the past, such as precious metals?

A couple of things to consider as you work on your final project... So how will you take this solid foundation and extrapolate the impact of this technological advance into the future?

Sources Cited

Benn, Charles (2002), *China's Golden Age: Everyday Life in the Tang Dynasty*, Oxford University Press, ISBN 0-19-517665-0

Bernholz, Peter (2003). *Monetary Regimes and Inflation: History, Economic and Political Relationships*. Edward Elgar Publishing. p. 53. ISBN 978-1-84376-155-6.

Bildener, Mary. "There Are (almost) as Many Cell Phone Subscriptions as People." *SmartPlanet*. N.p., n.d. Web. 24 Mar. 2014.

Cameron, Rondo E. (William Rand Kenan University Professor, Emory University in Atlanta, GA) *Concise Economic History of the World: From Paleolithic Times to the Present* Oxford University Press, 11 Mar 1993 Retrieved 2012-05-15

Feldman, Marian H. *Diplomacy by design: Luxury arts and an "international style" in the ancient Near East, 1400-1200 BCE*, University of Chicago Press, 2006, pp. 120-121

Fong, Jeff. "Bitcoin Price 2013: How Bitcoin Could Help the World's Poorest People." *PolicyMic*. PolicyMic, n.d. Web. 10 Mar. 2014.

Ghizoni, Sandra. "Establishment of the Bretton Woods System". US Federal Reserve. Retrieved 17 March 2014.

Greenberg, Andy (9 June 2011). Forbes
<http://www.forbes.com/sites/andygreenberg/2011/06/09/citibank-reveals-one-percent-of-all-accounts-exposed-in-hack/>

Johnson, Katie W. (18 November 2013). "PCI Security Standards Council Releases New Versions of Two Security Standards". The Bureau of National Affairs, Bloomberg. Retrieved 2013-11-25.

Kaufman, Matthew. "Bitcoin: The Currency of Poker's Future, or Just a Fad?" *News*:. PokerStrategy, n.d. Web. 24 Mar. 2014.

Keng, Cameron. "Bitcoin Is Not Anonymous And Is Always Taxable." Forbes. Forbes Magazine, 16 Dec. 2013. Web. 24 Mar. 2014.

Looney, Baba. "Republican Economic Policy." *Tokris QA*. N.p., n.d. Web. 24 Mar. 2014.

Macleod, Alasdair. "The Fiat Money Quantity (FMQ) | Finance And Economics." *Finance And Economics*. N.p., n.d. Web. 24 Mar. 2014.

Mankiw, Gregory N. (2014). Principles of Economics. p. 220. ISBN 978-1-285-16592-9. "fiat money: money without intrinsic value that is used as money because of government decree"

Manoocher, Deghati. "Deputy UN Chief Calls for Urgent Action to Tackle Global Sanitation Crisis." UN News Center. UN, 21 Mar. 2013. Web. 23 Mar. 2014.

Menn, Joseph. "Exclusive: Secret Contract Tied NSA and Security Industry Pioneer." Reuters. Thomson Reuters, 20 Dec. 2013. Web. 23 Mar. 2014.

Quintus Curtius Rufus, William Henry Crosby Quintus Curtius Rufus: Life and exploits of Alexander the Great D. Appleton and Company, 1858 , Retrieved 2012-05-15

Scarre, Chris, ed. (2009). The Human Past (2nd ed.). Thames&Hudson. p. 32.

Tainter, Joseph A. *The Collapse of Complex Societies*. Cambridge, Cambridgeshire: Cambridge UP, 1988. Print.

Thornton, Daniel L. "The Downside of Quantitative Easing." Economic Synopses (2010): n. pag. The Downside of Quantitative Easing. Federal Reserve Bank of St. Louis, 2010. Web.

Wilson, Jenny (June 7, 2011). "United Nations Report Declares Internet Access a Human Right". TIME Techland.