



# Crypto Currencies and their Destinies in the Future

**Mehmet Hasan Eken**

*Professor of Finance, Kırklareli Univesity, Kırklareli, Turkey*

**Erkut Baloğlu**

*Innovation & Customer Experience Director, Yapı Kredi A.Ş., Istanbul, Turkey*

## Abstract

*In this article the features of Crypto Currencies, which are not backed by governments, are investigated with regards to their specialties, usage areas and current structures. In this context the newly invented crypto currencies are compared with currency types that were in use in different periods of history. A similarity between Crypto Currencies and Free Banking Era Banknotes is noticed and thus investigated in details. The possible risks and outcomes with regards to the future usage of crypto currencies are analyzed and elaborated.*

**Key Words:** *Crypto Currency, Digitalization, Free Banking Era, Wildcat Banks, Blockchain*

**JEL classification:** *E42; E40; O3*

## Introduction

For the past few years the future of money has received considerable attention. Technological changes coupled with the digitalization of business models created conditions for the emergence of new types of money in different forms of crypto currencies. These digital forms of money could enable a more efficient and free economy. On the other hand they could decrease the effectiveness of macroeconomic policy, increase economic volatility and even facilitate criminal activity.

In this paper we target to elaborate the future of the crypto currencies by examining the historical development of different types of money. The remaining of this article is structured as follows. At the first section a broad definition of money is made in order to better understand the concept of money. The second part contains brief information related to historical development of different types of money. The third part of this article provides details of the similarities between crypto currencies and estimation about the evolution of crypto currencies by looking into the historical events that happened to the similar money type. Finally the fourth part is conclusion.

## **Literature Review**

### **Definition of Money**

Money; which can be any subject tangible or intangible; serves as a medium of exchange and is widely accepted as both a storage and a measure of value. The subject used as money is defined by people. If people accept something as a medium of exchange, it becomes money. There are periods in history while sea shells, beaver skins or corn seeds were used as money.

Economy as well as social life is working on exchange of goods and services in markets. The primitive way to exchange these items is barter. Bartering is not efficient and practical; besides potential buyers must find things that individual sellers will accept. It also contains uncertainty related to that the buyers may not know what the sellers require or is willing to accept before the transaction is exercised. To manage this uncertainty the actors in the market have to settle on something that would serve as a medium of exchange, which would be widely accepted as money.

The substance that is being chosen by the market as money should hold these features (Davies, 2002);

- Cognizability: clearly identified, recognizable
- Utility: the substance it was made of was usable for other purposes
- Divisibility: they can be divided into small, interchangeable amounts which make them ideal for trade.
- Portability : concentrated enough to be carried and transferred
- Indestructibility: It does not deteriorate or diminish as time passes
- Homogeneity: Fragments of same size and shape has the same value

If the actors in the market agree to use a substance as a medium of exchange, the second issue is to start measuring the goods and services with respect to this exchange subject (money) in order to settle transactions. As the transactions settled the prices of goods and services are determined. Thus these prices reflect the value of the goods in units of money being used as a unit of account.

Another definition for this issue is that, a substance becomes money after it is accepted by the authorities as a unit of accounting & taxation. If governments accept this substance as a legal accounting measure and accept tax payments made by using it, it can be said that this substance is showing strong money characteristic. As Fama (1980) stated money does not need to be a substance at all it can even be a numeraire.

Money also serves as the storage of value over time. Value is actually stored in other substances like gold, land, works of art...etc. But since money is a medium of exchange to buy all those substances, money is also storing value in itself.

The world is rich in diversity; there are many nations, languages, cultures, markets and currencies. Different countries use different currencies, those currencies are measuring the same commodities (like gold, copper) but their unit of measurement is different. One of the properties of modern money is convertibility to other monies used by other countries. Since these monies store the value of the same commodity, the money used in one country should be convertible to another one that is used in another country.

### **A Brief History of Money**

Through the history, the shape of money changed entirely as well as its form and usage methodologies while its purposes of being a medium of exchange and storage of value did not change at all (Castronova, 2015). Money has been seen in a lot of forms. In this section we are providing a brief introduction of the forms of money from ancient times to the present modern times.

The first forms of metal coins were Asian Cutlery around 1100 BC. These first forms were the little replicas of the tools that were used as a medium exchange for trading. These small figures then became round shaped because of a practical reason for carrying in pockets and bags easily (Beattie, 2015).

The first minted coin was created in Lydia (Western Anatolia) around 7th century B.C. The coins were a mixture of gold and silver. The value of the coin came from the amount of gold and silver in it. For more than 2000 years, this would be the common practice in the world (Davies, 2002).

The first representatives of paper money can be traced back to the medieval times. In China Paper started to be used as a representative sign of value existing in metals between individuals. The government, borrowing the invention from private individuals, wished to make a real money of paper. In this way China experienced well over 500 years of paper currencies (Davies, 2002).

In 17th century the common usage in Europe was still coins. Some forms of bank notes for depositors started to be used during the transportation of depositors. In 1672 The Governor and Company of the Bank of England issued banknotes in England. In 1697 the Government renewed and extended the privileges of the Bank. This scheme continued till the beginning of the nineteenth century no less than seven times. By about 1780, the Bank of England came to a position of huge strength that the majority of private note issues by other banks were abandoned and the smaller banks started keeping balances with the Bank of England. In other words the bank started to acquire the characteristics of a Central Bank. Scotland followed England almost immediately; In 1695 The Bank of Scotland was founded. The Bank received under Charter from the Scottish Parliament a monopoly for twenty-one years and started issuing notes (Smith, 1936).

In 1716 Banque Generale was established in France with the authority to issue notes. The bank was closed in 1720 also causing a general stock market crash due to the over-issuance of paper money. This incident postponed banking development in France for many years.

During the first colonial years in America the colonists were engaged in barter due to the lack of minted coins in the continent. Colonists used commodity money as a medium of exchange for a short period of time. The Massachusetts Bay Colony used corn and beaver skins, Southern colonies used tobacco and rice. Commodity money value was highly affected by supply and demand, it was costly to store and transport and lacked uniformity. Foreign coins were also in use but there were exchange problems as their values varied from colony to colony (Davies, 2002).

The attempts of issuing money were a struggle between colonies and the King. The Massachusetts Bay Colony established a mint in Boston in 1652. The coins minted were the Willow Tree Shillings, Oak Tree Shillings, and Pine Tree Shillings. In 1684 the king banned the usage of these coins and the mint was closed. In 1690 the colony was authorized to print Bills of Credit in return of their efforts on raising troops to help British soldiers fight in King William's War. The printed notes were issued as five, ten, and twenty shillings. These bills circulated freely, and eventually each New England province began to print its own notes. In 1752, the British Parliament forbids the Massachusetts Bay Colony to issue money in any form. In 1755 the Revolutionary War started and the Continental Congress issued paper money to finance the war (Davies, 2002).

After the independence, the first attempts of building a Banking System in USA were the establishments of First Bank and Second Bank. These banks had been both public and private institutions. In 1836 when Congress closed the Second Bank of the United States (as it had done to the First Bank before) the free banking era started. During Free Banking Era, entry into banking was easy, little supervision was provided by the government, there was no government guarantee on deposits and banks could issue their own currencies. The rules of issuing a Banknote were as follows (Rolnick and Weber, 1982);

- All notes the bank issued had to be backed
- State bonds or gold can be used to back the note
- All notes had to be redeemable on demand at par, or face, value.

- If a bank fails to redeem for payment. The authority would close the bank, sell the bonds, and pay to the noteholders.

As stated by Rolnick & Weber (1982) in 1860 a majority of 33 states in the United States had some form of free banking and a huge number of Banks were opened and closed. 709 free banks were opened only in 4 states (New York, Indiana, Wisconsin and Minnesota) between 1838 and 1863. 48% of these banks were closed in short periods, 7% of them were closed in less than a year after their establishment (Rolnick and Weber, 1982).

During those 37 years, banks could issue their own banknotes (own currency) and many noteholders suffered since some of the banks closed down and bankers ran away. As stated by Rockoff (1991) some of the bankers had no intention of redeeming at the first place. These bankers were called wildcat bankers and their banknotes were called wildcat money. This naming was because of their choice of redemption office locations, on the countryside, remote and hard to travel where only wildcats live. Also as stated by Rolnick and Weber (1982) another group of Bankers who issued money that were backed by state bonds had to close down due to price volatility of the bond. As the price of the state bonds dropped down, these bankers just found out that going out of business was more profitable than operating.

As stated by Smith (1936) The Free Banking Experience was ended with a series of regulations, consolidations and government guarantees. First The Treasury issued a bill of legal tender irredeemable paper (government bank note) and started forcing banks for making the government bank notes legal tender. Second in 1864 an act that regulated the free bank notes enacted. This act as explained by Smith (1936) was backing the bank notes "In the event of a bank defaulting on its notes, the United States Treasury would sell the bonds and pay the notes itself." Another act passed in 1865 that penalized the banks not entering the system with a tax of 10%. This was practically ended the Free Banking Era. The free banking notes eventually extinct and replaced by government bonds.

The modern paper money became common in 19th century and during the two World Wars in the 20th century, governments suspended the gold standard and printed unbacked money to support their economies. After some attempts of restoring the gold standard, the gold standard is relaxed totally in 1971 by Nixon and the power of money became directly related with the power of the governments. This type of money is called Fiat Money.

As once the Von Mises (1912) theorized:

*"Before an economic good begins to function as money it must already possess exchange-value based on some other cause than its monetary function. But money that already functions as such may remain valuable even when the original source of its exchange-value has ceased to exist."*

Today all currencies in the world are fiat monies that are non-gold backed systems. They have no value in themselves and are not backed by gold or silver. Their value comes from the power of the governments that issues them and their practical usage as a mean of exchange and a representation of assets in accounting.

Fiat money loses value rapidly and creates inflation during periods of wars, political tribulations or civil unrest, as people lose confidence in their governments. After World War I, Germany printed so much money and caused hyperinflation that in 1923 a huge bag full of paper money could hardly buy a loaf of bread. After World War II in Hungary, the government printed money to recover the economy. After that the purchasing power of Hungarian Pengő decreased tremendously in a year from September 1945 to July 1946 (Siklos 1991). But in these examples as governments regained strength the trust in fiat money returned and it again sustained a stable environment.

## **Online Virtual Currencies**

There are two main groups of these currencies. The first group is Game Money; the currency types that are members of this group are usually used in games to purchase some virtual assets within the game. The

latter group contains Crypto Currencies; the most famous one is named Bitcoin. This group consists of currency types that are running under Block Chain technology.

With the progress of digitization, virtual goods started to be offered in social media and in games. The concept of virtual currencies that are valid only in specific platforms and games emerged. Widely known examples include Facebook Credits, Amazon Coins, World of Warcraft Gold, Linden Dollars etc.

These currencies are issued by companies, they have no physical existence and they are not backed by real assets or any governments. Their values mostly come from their practicality in the exchange within specific platforms. These game monies can also be earned by doing some specific activities in the game/platform and then be spent to purchase some virtual goods. Ex: World of Warcraft gold can be earned within the game and players can use them to purchase specialized weapons to use in the game.

The convertibility of game money varies;

- One Way Convertible: Game money can be bought by using credit card but money earned within the game cannot be converted to any fiat money such as dollars. Players can trick the game by making a money transfer in real world in parallel to a transfer in the game. (Ex: player 1 sends world of Warcraft gold in the game to player 2, player 2 sends dollars to player 1 in real world) But this is not common since the conversion rate at this case depends on the private agreement between players
- Convertible : Both ways of convertibility is possible (Ex: Linden dollars)

Usually game monies are designed to be one way convertible since their purpose is to improve the activity of the game platform and enable users to remove some obstacles in the game by purchasing some facilities. Also making it convertible raise issues like property rights and enables fraudsters. As happened to Linden Dollar in 2007 when Ginko Financial, a virtual bank operating in the game, went bankrupt and was unable to repay deposits collected from Second Life residents. After a series of discussions Linden Lab banned virtual banks that cannot furnish “proof of an applicable government registration statement or financial institution charter.” from the real world (Talbot, 2008).

On the other hand Crypto Currencies are online, virtual, convertible money types. They are developed as using cryptography techniques and are specifically designed to be supplied at a predetermined and knowable rate. They are not backed by gold or they do not derive their power from governments. Their value is totally dependent on their acceptance as a means of payment, their anonymity (the transactions are done anonymously in the network) and the intractability of the parties that are engaged in a crypto currency transaction (Gans and Halaburda, 2015).

The most famous of this money type is Bitcoin that was created in 2009. It is famous since it is the first completely decentralized digital currency with no trusted party backing it (Brito and Castillo 2016). It is not only decentralized it is also anonymous. Its creator is unknown although a programmer using the nickname “Satoshi Nakamoto” seems to be its creator. In an online bulletin posted by Nakamoto criticized the trust required for the current system to work.

*“The root problem with conventional currency is all the trust that's required to make it work. The central bank must be trusted not to debase the currency, but the history of fiat currencies is full of breaches of that trust. Banks must be trusted to hold our money and transfer it electronically, but they lend it out in waves of credit bubbles with barely a fraction in reserve. We have to trust them with our privacy, trust them not to let identity thieves drain our accounts” (Nakamoto, 2009).”*

Crypto Currencies work on Block Chain Technology which is an online distributed ledger. The mechanism provides a solution to eliminate a central trusted authority by defining an electronic chain of digital signatures and publicly announcing it to enable verification. They are convertible, pure digital, anonymous currencies. They are not associated with any company. The transactions are powered by the collective computational power of the bitcoin miners. These miners earn bitcoins as they help the transactions (by

solving the complex mathematical crypto problem) and they will be taking commissions though they are not taking yet (Turbin, 2014).

Crypto Currencies have a number of disadvantages which are shown below.

- They are vulnerable to hacking attacks. Hackers may steal bitcoins via phishing attacks directly from the client's electronic wallets or by exploiting software security flaws as happened in MT Gox case in 2014.
- Crypto currencies currently have no insurance or government protection. Bank deposits are guaranteed by governments but crypto currency owners have no legal coverage.
- They have limited supply by definition. This makes nearly impossible for a government to execute monetary policies and also puts pressure on deflation.

## **Crypto Currency Versus The Other Types of Money**

Here in this section we analyze the essence of crypto currencies by comparing them with the other money types. In order to quantify similarities and dissimilarities and investigate the issue in a structured way, we designed a scoring table to value the similarity of crypto currencies with the other money types that are evaluated in the following two tables.

The basis of our comparison scoring depends on the definition of money that was discussed in section 1. A substance should have three main properties to become money. These properties are (1) being a medium of exchange, (2) being the storage of value and (3) being a unit of account. We assign a set of points to each of these properties and then fragment these properties to provide a better understanding. The scoring details are as follows;

### **Means of Payment (60 points)**

#### Practical Acceptance (30 points)

- by governments for payments (10 points)
- by physical markets (10 points)
- by e-commerce markets (10 points)

#### Medium of Exchange (30 points)

- Scarcity (5 points)
- Durability (5 points)
- Divisibility (5 points)
- Transferability/portable (5 points)
- Proven (5 points)
- Use value (5 points)

### **Unit of Account (20 points)**

Used as a measure of Value in Accounting (10 points)

Accepted in Tax Payments (10 points)

### **Storage of Value (20 points)**

Acceptance as a Value (10 points)

Convertibility to Fiat Money (10 points)

We evaluate the similarities of crypto currencies with respect to different money types by using this scoring table. We also add crude oil to the table to find out the similarities of any commodity to money. The results

can be seen in Table 1. Crypto currencies take a total value of 50 out of 100. 30 points come from being a means of payment and 15 points come from being a storage of value. The weakest part of crypto currencies is being a unit of accounting which is only 5 points.

**Table 1: Scoring of Different Money Types**

Definition of Money	Gold Money <sup>(1)</sup>	Free Banking Era Banknote <sup>(1)</sup>	Fiat Money	Crude Oil	Crypto Currency
Means of Payment (60 points)	50	35	50	32	30
<u>Practical Acceptance (30 points)</u>	<u>20</u>	<u>20</u>	<u>30</u>	<u>10</u>	<u>10</u>
by governments for payments (10 points)	10	10	10	5 <sup>(2)</sup>	5 <sup>(2)</sup>
by physical markets (10 points)	10	10	10	5 <sup>(2)</sup>	NA
by e-commerce markets (10 points)	NA	NA	10		5 <sup>(2)</sup>
<u>Medium of Exchange (30 points)</u>	<u>30</u>	<u>15</u>	<u>20</u>	22	20
Scarcity (5 points)	5			5	5
Durability (5 points)	5	5	5	5	5
Divisibility (5 points)	5	5	5	5	5
Transferability/portable (5 points)	5	5	5	2 <sup>(3)</sup>	5
Proven (5 points)	5		5		
Use value (5 points)	5			5	
Unit of Account (20 points)	20	20	20	5	5
<u>Measure of Value in Accounting (10 points)</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>0</u>	<u>0</u>
<u>Accepted in Tax Payments (10 points)</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>5<sup>(3)</sup></u>	<u>5<sup>(3)</sup></u>
Storage of Value (20 points)	20	10	20	20	15
<u>Acceptance as a Value (10 points)</u>	<u>10</u>	<u>5<sup>(4)</sup></u>	<u>10</u>	<u>10</u>	<u>5<sup>(6)</sup></u>
<u>Convertibility to Fiat Money (10 points)</u>	<u>10</u>	<u>5<sup>(5)</sup></u>	<u>10</u>	<u>10</u>	<u>10</u>
Total Score	90	65	90	57	50

(1) Scored with respect to its usage in its time zone

(2) May happen if both parties agreed but not a common practice

(3) Hard to transfer requires pipelines or transportation

(4) Which may not be the case since there are a lot of types and people from different states

(5) Convertible if the related banker did not run away

(6) Very volatile and still under discussion.

As can be seen that no currency type exist with a full score of 100. Two money types namely gold money and fiat money reached a top score of 90 out of 100. Gold money is not practical to use and fiat money is not scarce and has no use value.

The similarity of crypto currency with commonly used paper money (fiat money) is limited. Fiat money is much stronger as it is practically accepted as a means of payment by governments and ordinary markets whereas crypto currency is not widely recognized. Also crypto currency cannot be booked directly in accounting. You may book the dollar (or any fiat money) value of a crypto currency as you do with all assets but you cannot prepare a financial statement in terms of a crypto currency. On the other hand fiat money is the official measurement in accounting.

Crypto Currency seems to be similar to Crude Oil. They both can be used as a medium of exchange with some difficulties. They definitely store value and they lack being a measure of accounting. From this perspective crypto currency is a commodity more than a type of money. Since the volatility of its market price is high, it also seems like a risky commodity.

As stated by Fama (1980) a numeraire that has purchasing power can become money. Crypto currency being a number in its nature has the potential to become money if it is accepted by governments in tax payments and in accounting.

If we assume that Crypto Currency is recognized by governments, it will become a sort of wildcat money. In table 2 we calculated the scoring again and figured out that the money type that is most similar to crypto currency is the Free Banking Era Banknote or wildcat money. A similar comment was stated by Edward Castronova (2015) in his book *Wildcat Currency How the Virtual Money Revolution is Transforming The Economy* while he was discussing the confidence in money without providing a scoring and a comprehensive comparison with other money types.

**Table 2:** The Similarity of Free Banking Era Banknote with the Crypto Currency

Definition of Money	Free Banking Era Banknote	Crypto Currency
Means of Payment (60 points)	35	30
<u>Practical Acceptance (30 points)</u>	<u>20</u>	<u>10</u>
by governments for payments (10 points)	10	5
by physical markets (10 points)	10	NA
by e-commerce markets (10 points)	NA	5
<u>Medium of Exchange (30 points)</u>	<u>15</u>	<u>20</u>
Scarcity (5 points)		5
Durability (5 points)	5	5
Divisibility (5 points)	5	5
Transferability/portable (5 points)	5	5
Proven (5 points)		
Use value (5 points)		
Unit of Account (20 points)	20	<b>20</b>
<u>Measure of Value in Accounting (10 points)</u>	<u>10</u>	<u>10<sup>(1)</sup></u>
<u>Accepted in Tax Payments (10 points)</u>	<u>10</u>	<u>10<sup>(1)</sup></u>
Storage of Value (20 points)	10	15
<u>Acceptance as a Value (10 points)</u>	<u>5</u>	<u>5</u>
<u>Convertibility to Fiat Money (10 points)</u>	<u>5</u>	<u>10</u>
Total Score	65	65

(1) Assuming crypto currency is recognized by governments

Also there are few more features that are beyond our scoring and yet these money types are sharing;

- They are both practically used in markets and accepted as a means of payment, but their coverages are limited. Wildcat money were accepted in specific locations, where the issuer bank is known, similarly Crypto Currency is accepted in specific online marketplaces.
- In theory Free Banking Era Banknote is backed with gold or government bond but practically as market prices changed rapidly or Bankers ran away there were times when this guarantee did not work properly. In other words the reliability of wildcat money is highly dependent on the acceptance in the market. (Much like crypto currency)
- Crypto Currency is cheap in transaction cost (Turbin, 2014) and also Wildcat Money transaction saves money since carrying paper is much easier than carrying gold.
- Crypto Currency is compact with respect to paper money. Similarly in its time zone Wildcat Money was compact with respect to gold money.
- Crypto Currency is more portable with respect to paper money. It can be transferred online across the globe without an intermediary (like corresponding banks). Also wildcat money in its time zone was more portable than gold money.



- Crypto Currency is decentralized. Also wildcat money was decentralized. It was issued by hundreds of banks.
- There are 1244 types of Crypto Currencies (as of 01.11.2017) and are still increasing in numbers rapidly similarly there were 709 free banks opened only in 4 states (New York, Indiana, Wisconsin and Minnesota) between 1838 and 1863. (Rolnick & Weber (1982)).
- Exchanging Crypto Currency for gold or US dollars is possible today so as was for wild cat money at the beginning. When things went wrong the wildcat money holders could not find the issuers to convert their money into gold. Will it be the same for crypto money owners if or when things go wrong?

Assuming its acceptance by governments and given the similarities Crypto Currencies may follow the historical evolution of wildcat money. The history of wildcat money and possible outcomes for crypto currency are compared and summarized as follows;

- Stage 1 - The Expansion: As happened at the beginning of Free Banking Era, there were little or no regulation and there was a profitable environment. No barriers were in place for entry. More than 709 free banks were opened in 4 states. Banks entered the market and tried to enjoy the opportunity. It is evident that this stage has already been passed for crypto currencies. Their numbers are already increased more than 1200 and there are no related regulations.
- Stage 2 – The First Crashes: The first fraud or bankrupt cases happened and people started to understand that they had no coverage for their wildcat money and they requested some solution. Similarly lots of attention is taken to the MT Gox case in 2014. Also some discussions started about cryptocurrency usage in black web purchasing illegal substances that resulted in the closure of Silk Road marketplace by FBI in 2014. It is not only the fraud problems but also the virtual currencies (crypto currency is a member of this family) are functioning in real economic life and they are making an expansion tendency. The wider their expansion the stronger the willingness of the central banks to supervise them like Fiat Money in order to control their supply. The Central Banks will probably find themselves in a stage that they have no other choices but control crypto currencies.
- Stage 3 – The First Regulations: The government authorities responded to the Wildcat Bank run away cases especially after they were widely spread or they started affecting the economy. They started enacting regulations as in 1864 act to regulate wildcat money. It is evident that the story of crypto currencies is at the beginning of this stage for. As discussed by Turbin (2014), in March 2013, the U.S. government issued regulations on online currencies stating that virtual currencies are to be regulated by the U.S. Treasury. China already banned usage as a legal currency in Dec 2013. The others are trying to overcome the border problem since it is a collective decentralized activity. FBI suggested controlling the marketplaces, exchanges, trading floors and other financial activities using cryptocurrencies instead of controlling the currency itself to overcome this border problem.
- Stage 4 – The Convergence: As happened after 1864 act to wildcat money. The governments around the world will probably issue their own crypto currencies and introduce them to the markets (i.e. issuing crypto USD working on block chain but incurred by FED and backed by the computation power of the government). Then they will regulate the market practically making the usage of anonymous crypto currencies unprofitable. As happened in 1865 act to wildcat money. Then crypto currencies will start to leave the web as converging with the regulated crypto money.

## Conclusions

As a fact wildcat money was a strong step towards paper money and eventually evolve to Fiat Money. Crypto Currencies may be at the beginning of a Digital Fiat Money Story that will be supported and regulated by governments.

The crypto currencies issued (if reach greater volumes) will affect the supply of money in the globe and their price volatility will affect the economies for sure. So it will become harder for the central banks to execute monetary policies while ignoring these currencies. Central banks will need to alter the crypto currency markets to create a controlled number of crypto currencies that have more stable prices.

Also the unfortunate incidents of MT Gox and Silk Road took the attention of legal parties such as FBI. Security is becoming an important issue. It is inevitable that some regulations on the usage of crypto currencies in e-commerce sites will come into life and for some governments imposing requirements on the security of e-wallet applications are inevitable.

Deriving from the above discussions it can be seen that governments will recognize crypto currencies in the future and central banks will issue their own crypto currencies for a better price stability, better security and better insurance (backed by the government). These crypto currencies (i.e. crypto \$ or crypto TL) will also be accepted by banks and government agencies. So opening a bank account or paying your tax via these currencies will be possible. Eventually all users and trade may migrate and consolidate on these currencies.

## References

- Beattie A. (2015), The History Of Money: From Barter To Banknotes Retrieved From: [http://www.investopedia.com/articles/07/roots\\_of\\_money.asp](http://www.investopedia.com/articles/07/roots_of_money.asp). DOI:10.12691/bb-2-3-2
- Belomytseva, O. S. (2015). Conceptual Framework for the Definition and Regulation of Virtual Currencies: International and Russian practices / Konceptualni okvir za definicijo in regulacijo virtualnih valut: mednarodne in ruske prakse. *Naše gospodarstvo/Our economy*, 61(5). DOI:10.1515/ngoe-2015-0020
- Brito, J., Castillo, A. M. (2016). Bitcoin: a primer for policymakers. *Arlington, VA: Mercatus Center, George Mason University*. ISSN: 1032-6634
- Castronova, E. (2015). Wildcat Currency: How the Virtual Money Revolution is Transforming the Economy. *New Haven: Yale University Press*. DOI:10.1017/eso.2015.44
- Davies G. (2002), A History of Money From Ancient Times to the Present Day, *University of Wales Press Cardiff*. DOI:10.1017/S0968565000001724
- Fama, E. F. (1980). Banking in the theory of finance. *Journal of Monetary Economics*, 6(1), 39-57. DOI:10.1016/0304-3932(80)90017-3
- Gans, J. S., Halaburda, H. (2015). Some Economics of Private Digital Currency. In *Economic Analysis of the Digital Economy* (pp. 257-276). University of Chicago Press. DOI:10.7208/chicago/9780226206981.003.0009
- Gordo J. (2014), Bitcoin: the New Era of Wildcat Banking, Retrieved from: [https://www.huffingtonpost.com/jason-gordo/wildcat-banking\\_b\\_5036050.html](https://www.huffingtonpost.com/jason-gordo/wildcat-banking_b_5036050.html)
- Hayek F.A. (1978), An Analysis of the Theory and Practice of Concurrent Currencies, Denationalisation of Money: The Argument Refined. *London: Inst. of Economic Affairs*. ISSN: 0073-2818

- Siklos L.V. (1991), *War Finance, Reconstruction, Hyperinflation and Stabilization in Hungary, 1938-48*. St. Martins Press Inc. DOI:10.1007/978-1-349-21325-2
- Mises, L. V., & Batson, H. E. (2013). *The theory of money and credit*. New York: Skyhorse Pub. ISBN:0-913966-70-3
- Nakamoto S. (2008), *Bitcoin: A Peer-to-Peer Electronic Cash System*, Retrieved from: <https://www.bing.com/cr?IG=3CEA6321048F445E84D930BC6B4BAA36&CID=1D15F69A51206D7A18D4FDF1508F6C7D&rd=1&h=G4iqivWHSMwNGt4IBUKQgJ-cuUepAtAvY5yyaxxGE80&v=1&r=https%3a%2f%2fbitcoin.org%2fbitcoin.pdf&p=DevEx,5064.1>
- Rolnick A., Weber E.W. (1982), *Free Banking Wildcat Banking and Shinplasters*, *Federal Reserve Bank of Minneapolis Quarterly Review* 6(3).
- Rockoff H. (1991). *Lessons from the American Experience with Free Banking*. *Unregulated Banking*, 73-129. DOI:10.1007/978-1-349-11398-9\_3
- Smith V.C. (1936), *The Rationale of Central Banking and the Free Banking Alternative*, *Liberty Press Edition*. ISBN:0-86597-086-6
- Srokosz W., Kopciaski T. (2015), *Legal and Economic Analysis of the Crypto Currencies Impact on The Financial System Stability*, *Journal of Teaching and Education*, 619-627. ISSN: 2165-6266
- Talbot D. (2008), *Second Life Closes Banks*, *MIT Technology Review*, Retrieved From: <https://www.technologyreview.com/s/409373/second-life-closes-banks/>
- Turbin J. B. (2014), *Bitcoin: The Economic Case for a Global, Virtual Currency Operating in an Unexplored Legal Framework*, *Indiana Journal of Global Legal Studies: Vol. 21: Iss. 1, Article 13* 335-368. DOI 10.2979/indjglolegstu.21.1.335.