# Transformation Of Money Based On Historical Studies

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**Abstract :** The purpose of this paper is to investigate and map the transformation of money based on historical studies. Based on historical literature, humans have long known money. From goods money, coins and banknotes. Trading needs dominated the needs of money in the past. In this paper, we try to examine the transformation of money based on historical studies of money and technological developments using content analysis. We collected historical literature to map the transformation of money and shifts in the value of money following the historical development of human technology. We find that the transformation of money occurs due to technological developments and the human need for money.

**Keywords:** Money, Finance, History, Transformation Of Money, Barter, Bitcoin, Fiat Money.

## 1. INTRODUCTION

Humans need to fulfill their basic, secondary, and tertiary needs (Doyle, et al., 2017). Human needs are unlimited in nature, while the resources they have are always limited. With limited resources, each human being needs another human being to meet each other's needs. World population growth and production growth to meet human needs must be balanced. World population growth needs to be accompanied by growth in world production, where all people on earth must work together in balancing world production growth with population growth (Dolgonosov, 2016). This world-wide human cooperation runs naturally because of man's natural impulse, namely to fulfill his needs and the nature of human limitations so that he is interdependent between one human being and another so that a medium of exchange is needed. Human needs with the growth of production increasingly make humans specialize in work where all people in the world lead to cooperation in balancing human growth with production by using the medium of exchange as an intermediary in meeting the increasingly diverse needs of life. The exchange instrument has a role in facilitating exchange to meet needs and measuring remuneration for work performed by humans (Barbieri, 2019). The process of meeting needs by exchanging resources both in the form of goods and other means of exchange has occurred thousands of years ago and continues until now. The process of exchanging goods with a medium of exchange known as money transforms. Money should have an exchange rate for goods with a stable value because the process of distributing goods requires time so that the stability of the exchange rate as a means of payment must compensate for the costs of producing and distributing these goods to the consumption process (Stein & Braun, 2019). Currently, money (fiat money) as a medium of exchange has an unpredictable value. The exchange rate of money for goods, which continues to decline from time to time, knows n as inflation, is a global problem that needs to be given a complete solution to maintain justice for every human being in their respective fields of work. The costs of world wars one and two in the 19th century were paid directly by the countries participating in the war and all humanity (Ogborn, 2011). With war two, one, and two, many countries suffered from damaged infrastructure and production decline. As a result, many countries are no longer able to back up their money with gold. Coupled with the post-world war baby boomer, it resulted in a shock to world population growth, resulting in an imbalance of production with population growth, which resulted in an economic crisis and shocks in the exchange rate of money (fiat money) for goods (Marchiori, 2011). Research on the stability of currency exchange rates for goods is important in understanding, mapping, and making decisions regarding policies for governments and individual decisions in adapting to the ever-changing world economic conditions. For this reason, the study of money transformation and the ability to maintain the stability of its exchange rate for goods is significant as a reference for the government to design monetary policy and society in making decisions related to how they choose money so that people avoid the risks inherent in money, especially in the digital era when this (Cabral & Díaz, 2015). In history, money has been transformed since 300 BC. The money transformation adapts to the people's needs for money. However, the transformation of money also costs the instability of the value of money. This happens because of the transformation of money from thousands of years ago to the present in an increasingly intangible physical direction or increasingly digital. This raises problems in the form of stability in the value of money for goods.

## 2 LITERATURE REVIEW

Money has existed since the emergence of humans with the development of increasingly diverse life necessities. The use of money in goods has been going on for thousands of years ago. Divided into three periods, namely:
1. Commodity exchange period (barter)
2. Exchange period with a medium of exchange (money)
3. Exchange period by credit

The period of commodity exchange (Barter) lasted from 9000 BC to 2500 BC. At that time, humans began to develop specialized skills. However, it still fulfills most of its needs independently (Haviland, et al., 2013). The exchange period with a medium of exchange (money) starts from 2500 BC to the present. And, the period of exchange with credit began in the 18th century until now. The history of the money goes back for thousands of years. Agricultural and livestock products function as money or a medium of exchange to meet daily needs and have been known to humans since 9000 BC. During that period, people still relied on agricultural and livestock products as a medium of exchange. This was common at that time. Egyptian society used gold, silver and copper as money since 2500 BC. Turkey started using metal coins as currency since 700 BC. In 600 BC, China began to use bronze as money (Beaujard, 2019). The Roman Empire used copper, silver, and gold as a material for making coins since 300 BC. The Roman Empire with its power conquered more than 20% of the world's human population under Roman rule in the period 300 BC to 700 AD So that Roman coins became the dominant currency in the world at that time (McLaughlin, 2014). The history of paper money can be traced back to the history of China in the Tang dynasty, Ts'ailun, in the 1st century AD, the Chinese started using paper money as a representative of coins. This inspired the use of paper as currency in European kingdoms since 1300 AD. At that time, paper money had a value based on government gold reserves which were stored as gold reserves. Thus, banknotes represent gold that the government must pay to holders of these banknotes. Since then, paper money has been used as money. Gold was kept in banks and replaced with paper money (Dillon, 2016). The shift of the instruments of payment from gold and silver to paper reached its peak in the 18th century. Countries in the world have started issuing their respective currencies so that the manufacture of payment instruments is cheaper. Paper tends to be easier and cheaper to produce than gold and silver so that the popularity of paper money is increasing as a representative of gold and silver and allows countries in the world fulfil people's need for money because of the use of these banknotes. During this period, the economy grew. Banks began to be built as intermediaries for the money printing authorities, namely the central bank and the public (Grace, 2014). The United States began using paper money in 1861. The United States government guaranteed that it would redeem several banknotes issued with the amount of gold indicated on these banknotes. Since that time period, transactions in the United States no longer require the use of gold but use paper money ( Bittker, et al., 2015). During the First World War, the United States became a neutral country with a focus on developing domestic industry. This causes the economic performance of the United States to continue to increase. The economy of the United States, which continues to grow and grows rapidly, provides the United States with the ability to lend to Britain and France. The United States conducts trade with countries in Europe. The United States stopped being neutral since 1917 due to Germany's attitude at that time, which dragged the United States into a world war. Germany carried out many sinks of US ships that prompted the United States to join the world war. World War One ended in 1918 where the United States became one of the world's economic powers. This has led to the USD becoming the most widely used currency in the world ever since (Setzekorn, 2018). The United States has not used gold as the underlying value of the USD since 1971. Since 1971, an era began where paper money did not represent gold (Anderson, 2019). Money transformation continued in 2009, since the discovery of crypto or the first digital money, namely bitcoin. Digital money is developing with various types of crypto money massively following the development of bitcoin. Digital money allows humans to transact around the world without significant transaction fees without any foreign currency exchange fees, tax-free, and anonymously. So ideally crypto money is more efficient in terms of transaction costs. (Krishnamoorthy, 2019). Money is a medium of exchange that is generally accepted by the community. Money can be anything that can be used using a medium of exchange. The medium of exchange (money) can be in the form of commodities in the form of goods that everyone can receive in a society, such as staple food, coffee, shells, gold, silver, and so on (Larue, 2020). Money can be in the form of a cash withdrawal warrant, such as a check. Money can be in the form of debt recognition, such as credit cards. Common money today is in the form of currency legalized by the country's laws that issued the currency such as Rupiah in Indonesia, Dollar in America, Bath in Thailand. And each currency is also likely to be accepted by humans outside the country's authority that issued the currency. Commodities are goods and services produced by humans in the world that are consumed to meet human needs. There is a relationship between the balance of production growth, population growth, and the medium of exchange.

## 4 Research methods

We use content analysis to analyze historical money transformations to map money transformations. Content Analysis is a quantitative and qualitative method that offers a more objective evaluation of the content. Content analysis provides a more accurate analysis than impression-based comparisons of any information from the literature. This is more effective than a review or evaluation.

## 5 Discussion

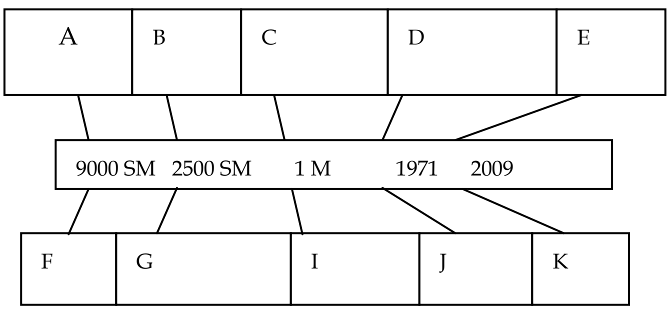
### 5.1 Content Analysis

Based on the literature review, several factors cause shifts in the value of money in money transformation, namely:

1. Development of the medium of exchange
2. Trade development
3. Technology development
4. The condition of the world economy

The development of human transaction needs that require a medium of exchange that is easy to move and has long-term durability is the main cause of the transformation of money from non-mining commodities, especially gold, to mining goods, which requires a process of more than 1000 years. This can be seen from transforming money into non-gold goods from 9000 BC to the use of mining goods in 2500 BC. The development of the medium of exchange shifted the human trafficking system, which was originally bartering, starting to use a medium of exchange in the form of mining goods, which focused on using gold as the world's main medium of exchange. The development of world trade, which is increasingly global, requires a medium of exchange that is safe to carry anywhere. Paper technology development in China revolutionized the medium of exchange from mining goods to paper starting in the early 1st century AD. The invention of durable paper made of Murbey bark began to shift the value of money, which was originally based on scarcity and durability, to represent banknotes for certain mining goods, generally gold and silver. The coin (mining) transformation that began in 2500 BC. Transforming into banknotes that represent gold and/or silver requires a process of more than 13 centuries. Starting from the 1st century AD in China and began to be adopted by kingdoms in Europe and the world in the 13th century AD. The process of transforming coins into banknotes fostered the banking industry and world trade. However, the trade process continues to develop, and the political factors that have resulted in the world war in the 19th century have caused shocks in the world economy. The pre- and post-war world economic conditions were the main factor in the shift in money's value and the transformation of world money from gold-represented paper money to paper money without being represented by gold (fiat money). It started in the

USA in 1971. The value of money, which was originally in the form of representation (representative value), shifted to the authority's value for issuing banknotes without being represented by gold. In 2009, the development of information technology, especially crypto technology, again rocked the world's finances with the emergence of the first crypto money, namely bitcoin. Process crypto money so that it becomes the value it is today (2018). Requires only 3 years of process. In three years, bitcoin has a value of more than one thousand percent from the beginning of its appearance in 2009 and has grown its exchange rate with a very fantastic rate of more than one million percent (2017), higher than the beginning of its appearance in 2009. In 2013, an anti-crypto currency policy began to emerge initiated by China and the increasing number of countries that prohibit cryptocurrency from being used in their country. However, the ban on the use of the cryptocurrency that is increasingly widespread has not reversed the long-term trend of bitcoin's exchange rate as the world's first cryptocurrency. The shifts in value and the transformation of money are summarized in the following miles stone:.

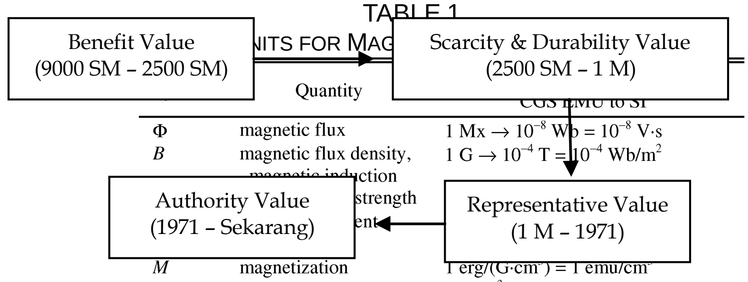



Explanation :

A = Non-Mining Commodity Money
B = Commodity Money for Mining Goods
C = Banknotes represent Mining Goods
D = Banknotes are not represented by Mining Goods
E = Synthetic money
F = Money Value : Benefit Value
G = Money Value : Scarcity and Durability Value
H = Money Value : Representatif Value
I = Money Value : Representatif Value
J = Money Value : Authority Value
K = Money Value : Scarcity and Demand

5.2 Typology of Money
The transformation of money in the past is still valid today, and in modern times, it is possible to exchange commodities using the barter system. The form of bartering in modern times is bartering for natural resources and goods and bartering technology and electricity and computer data networks. All forms of money transformation can be used as money in the present (Wagenvoord & Pervez, (2013). In a variety of literature on the history of money and financial journals, it turns out that the money we use has experienced value shifts and transformations following the history of world financial developments for more than two thousand years. We try to summarize the money shift using flow chat as follows:.

TABLE 1
...NITS FOR MAG...

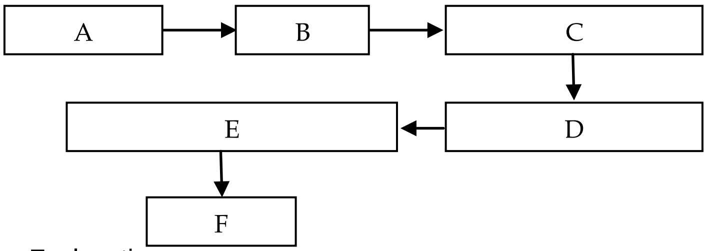



| Symbol | Quantity | CGS EMU to SI |
|---|---|---|
| $\Phi$ | magnetic flux | $1\ Mx \rightarrow 10^{-8}\ Wb = 10^{-8}\ V\cdot s$ |
| $B$ | magnetic flux density, magnetic induction | $1\ G \rightarrow 10^{-4}\ T = 10^{-4}\ Wb/m^2$ |
| | ...strength | |
| | ...ent | |
| $M$ | magnetization | $1\ erg/(G\cdot cm^3) = 1\ emu/cm^3 \rightarrow 10^3\ A/m$ |
| $4\pi M$ | magnetization | $1\ G \rightarrow 10^3/(4\pi)\ A/m$ |
| $\sigma$ | specific magnetization | $1\ erg/(G\cdot g) = 1\ emu/g \rightarrow 1\ A\cdot m^2/kg$ |
| $j$ | magnetic dipole moment | $1\ erg/G = 1\ emu \rightarrow 4\pi \times 10^{-10}\ Wb\cdot m$ |
| $J$ | magnetic polarization | $1\ erg/(G\cdot cm^3) = 1\ emu/cm^3 \rightarrow 4\pi \times 10^{-4}\ T$ |
| $\chi, \kappa$ | susceptibility | $1 \rightarrow 4\pi$ |
| $\chi_\rho$ | mass susceptibility | $1\ cm^3/g \rightarrow 4\pi \times 10^{-3}\ m^3/kg$ |
| $\mu$ | permeability | $1 \rightarrow 4\pi \times 10^{-7}\ H/m = 4\pi \times 10^{-7}\ Wb/(A\cdot m)$ |
| $\mu_r$ | relative permeability | $\mu \rightarrow \mu_r$ |
| $w, W$ | energy density | $1\ erg/cm^3 \rightarrow 10^{-1}\ J/m^3$ |
| $N, D$ | demagnetizing factor | $1 \rightarrow 1/(4\pi)$ |

Statements that serve as captions for the entire table do not need footnote letters.
[a]Gaussian units are the same as cgs emu for magnetostatics; Mx = maxwell, G = gauss, Oe = oersted; Wb = weber, V = volt, s = second, T = tesla, m = meter, A = ampere, J = joule, kg = kilogram, H = henry.

Humans used agricultural products as currency or medium of exchange from 9000 BC to the start of the Egyptian society using gold as money since 2500 BC. The use of agricultural products as a medium of exchange is referred to as money goods, where the value of money is assessed by the benefits of the goods exchanged (benefit value). Since gold was used as currency, the value of money has shifted from being based on benefits to being based on scarcity and durability. Gold or metal coins began to be used by humans since 2500 BC. The disadvantage of agricultural products is that they cannot be stored for a long time. So that other goods are needed as substitutes for agricultural products that can be used as a medium of exchange and a store of wealth. Gold is a popular metal to meet the durability needs of money. This has caused the popularity of gold coins to rise to replace money from agricultural products. The value of money shifted again since the discovery of banknotes in China in 1 AD. Banknotes made transactions easier because they had a nominal value on the paper, which represented the amount of gold represented. The need for money for transaction purposes has made banknotes popular since the 18th century. The shift in the value of money had occurred again since 1971, when the United States, whose currency became the currency most used in the world or dominated the world, no longer backed up its money with gold. The loss of gold as the basis for the value of banknotes resulted in instability in the value of banknotes. The stability of the money value of goods is necessary to maintain price certainty to determine efficient business decisions. Rational decisions can manage trade transactions and wealth transfers among the actors therein. The tendency of people to look for a medium of exchange that has exchange rate stability continues. However, the transfer of wealth, in this case, money, is also an important part of trading transactions. Money is changed to meet the stability of money and facilitate the movement of money itself with lower transaction costs.

Money transformation in terms of seeking a form of money that can maintain exchange rate stability, ease of use and transfer (money transfer) and low transaction costs, historically money was transformed as follows:




Explanation :

A = Goods Money (9000 SM – 2500 SM)
B = Metal Money (2500 SM – 1 M)
C = Paper Money as representatif of Gold (1 M – 1971)
D = Paper Money as representatif of nation (1971 – Sekarang)
E = Electronic Money asrepresentatif of Paper Money (1860– sekarang)
F = Crypto Money (2009 – Sekarang)

The shift in the value of money stops in the form of paper money. However, since 2009 there has been a new currency that has challenged paper money, namely crypto money. Crypto money offers more efficient use of paper money to transfer money (finance mobility), which is faster and lower in terms of transaction costs. However, crypto money has properties similar to gold; namely, the amount is fixed and needs to be mined. Bitcoin has the potential to function as a store of value due to its strict commitment to low (scarce) supply growth, credibly supported by the network's distributed protocols and credible demonstrations of the absence of an authority capable of changing supply schedules. Every currency transformation has a value that is offered for each money transformation. And each transformation has a different level of ability to maintain its exchange rate. Starting from money, goods that offer direct benefits for consumption, however, are generally less durable. Gold money with long durability and rare but cannot be consumed directly. Gold in modern times is consumed as jewelry and in electronic devices such as microprocessors. Banknotes cannot be consumed directly or processed to become a product. Likewise, when it is transformed into electronic money or crypto money. It cannot be consumed directly and only functions as a means of payment. Money exchange rate fluctuations can naturally be caused by business or trade activities, domestic trade, and trade between n countries where the business or trade climate tends to be volatile or never stable. These trading activities also influence the production of the real sector. There is a tug of war between the demand and supply of money in terms of consumption and investment (Production). Each form of money transformation has a different resistance to real sector turbulence. The amount of money supply and demand has a relationship with the exchange rate of money, including the exchange rate of money against goods. There is a relationship between scarcity, and the exchange rate is formed from the relationship between capital (capital) and labor. The value of a commodity, including money, is related to its production costs. So that there is a relationship between money, commodities, and production. Money demand itself is related to the real sector, or it can be said that the Gross domestic product affects the demand for money. The real sector influences the demand for money through investment and credit channels. The fluctuation of money demand also affects the exchange rate of money for goods. This indicates that there is a relationship between money demand and inflation. So that there is a relationship between interest rates, investment, and inflation. Each form of money transformation has a different cost of production, with different production costs. And the ability of each individual or state to produce each form of money transformation is limited by different amounts of capital and resources, resulting in the resilience of each form of money transformation against different exchange rate volatility. However, the difference in the resistance of each form of money transformation is closely related to the nature of each form of money transformation itself. Like crypto money. Early generation crypto money, namely bitcoin, tends to have properties similar to gold. That is, no authority regulates its production worldwide. It is rare and requires a production cost that is relatively higher than the cost of producing banknotes. Bitcoin has an exchange rate that tends to increase due to its limited quantity and high production costs. In contrast to crypto money shaded by certain authorities, it is actually similar to paper money. And the stability of crypto money other than bitcoin associated with certain authorities tends not to have a level of exchange rate volatility as high as bitcoin.

**Both physically and digitally, every item can be used or become money (means of payment) as long as it meets the money requirements. Money requirements include:**

1. Legal (not considered breaking the law)
2. Generally accepted
3. The value is relatively stable
4. Easy to store
5. Easy to carry
6. Not easily damaged
7. Easy to share

Money itself is a commonly used means of payment. The shift in value and the transformation of money that is increasingly losing its physical form (increasingly towards digital) impact the development of human trafficking activities that require fast, secure, and transferable transactions in a wide range. Money has three main functions, namely as a medium of exchange, a unit of calculation, and a store of value. Money as a means of payment is transformed into an increasingly digital form of money. The digitization of money is increasingly unstoppable. When the convenience obtained from the transformation of money leaves its physical state, the dangers of money are even greater. The challenge of securing money from financial crimes is growing. Global finance currently (2018) has passed four phases of money transformation, namely:

1. Commodity Phase (9000 BC - 1 AD)
2. Commodity Transition Phase to Fiat (1 M - 1971)
3. Fiat phase (1971-2009)
4. Transition Phase Fiat to Synthetic (Digital / Crypto) (2009 - present (2020)
5. Synthetic Phase (Digital / Crypto) (?)

The transformation of money from "commodity" to "fiat" which has been going on for thousands of years and has been the basis of money until now faces a third possibility. This third type is called "synthetic commodity money," or crypto money. Cryptocurrency, resembles paper money in that it has no non-monetary value; but it resembles commodity money in that it is not only generally accepted but extremely rare. Crypto money can be an alternative to international payments such as USD without requiring supervision from any monetary authority and has properties like gold. And is able to provide macroeconomic stability because it is rare like gold but does not have economic value like fiat.

## 4 CONCLUSION

Historically, money transformed over time and money continued to change shape in a direction that increasingly left physical money itself. The transformation of money and the development of technology go hand in hand where the transformation of money follows the development of human technology.

## REFERENCES


[1] Anderson,T.J.(2019).Money Without Boundaries. Hoboken : John Wiley and Sons

[2] Barbieri,E.,Di Tommaso,M.R.,Pollio,C., Rubini,L.(2019).Getting the specialization right. Industrialization in Southern China in a sustainable development perspective.World Development.Volume 126, February 2020, 104701. DOI :https://doi.org/10.1016/j.worlddev.2019.104701

[3] Beaujard,P.(2019).The Worlds of the Indian Ocean: A Global History.Cambridge : Cambridge Univesity Press

[4] Bittker,B.I., Idleman,S.C., Ravitch,F.S. (2015).Religion and the State in American Law.Cambridge : Cambridge University Press

[5] Cabral,R., Díaz,G.R.(2015).Is fiscal policy coordination desirable for a monetary union? An assessment from the perspective of a small open economy.Investigación Económica.Volume 74, Issue 294, October–December 2015, Pages 3-72. DOI : https://doi.org/10.1016/j.inveco.2015.11.001

[6] Dillon,M.(2016).Encyclopedia of Chinese History.London : Routledge

[7] Doyle,K.M., Santos,M.R.d., Szylit,R., Deatrick,J.A.(2017).Parental expectations of support from healthcare providers during pediatric life-threatening illness: A secondary, qualitative analysis.Journal of Pediatric Nursing.Volume 36, September–October 2017, Pages 163- 172.DOI :https://doi.org/10.1016/j.pedn.2017.05.008

[8] Dolgonosov,B.M.(2016).Knowledge production and world population dynamics.Technological Forecasting and Social Change.Volume 103, February 2016, Pages 127 141. DOI :https://doi.org/10.1016/j.techfore.2015.10.023

[9] Grace,R.J. (2014).Opium and Empire: The Lives and Careers of William Jardine and James Matheson.London : McGill-Queen's University Press

[10] Haviland,W.A., Prins,H.E.L., Walrath,D., McBride,B. (2013).Anthropology: The Human Challenge. London : Cengage Learning

[11] King,B.(2018).Bank 4.0: Banking Everywhere, Never at a Bank.Hoboken : John Wiley and Sons

[12] Krishnamoorthy,B.(2019).Unlock Secrets to a Wealthy Life: Redesign Your Life for Financial Success.Chennai : Notion Press

[13] Larue,L.(2020).The Ecology of Money: A Critical Assessment.Ecological Economics.Volume 178, December 2020, 106823. DOI : https://doi.org/10.1016/j.ecolecon.2020.106823

[14] McLaughlin,R.(2014).The Roman Empire and the Indian Ocean.South Yorkshire : Pen & Sword Military

[15] Marchiori,L.(2011).Demographic trends and international capital flows in an integrated world.Economic Modelling.Volume 28, Issue 5, September 2011, Pages 2100-2120.DOI :https://doi.org/10.1016/j.econmod.2011.05.001

[16] Ogborn,M.(2011).A war of words: speech, script and print in the Maroon War of 1795–6.Journal of Historical Geography.Volume 37, Issue 2, April 2011, Pages 203 215.DOI :https://doi.org/10.1016/j.jhg.2010.11.001

[17] Setzekorn,E.B.(2018).America Entering World War I (1917-1918): The U.S. Army Before the War (1917-1918).New York : Madison & Adam Press

[18] Stein,J Alexander Cornelius.,Braun,D.(2019).Stability of a time-homogeneous system of money and antimoney in an agent-based random economy.Physica A: Statistical Mechanics and its Applications.Volume 520, 15 April 2019, Pages 232-249.DOI :https://doi.org/10.1016/j.physa.2019.01.022

[19] Wagenvoord,D.Pervez,A.(2013).No Cash? No Problem!.New York : Morgan James Publishing