Competition versus money: the digital rouble and Gresham's law

Alexander I. Yakovlev

Candidate of Economics, Associate Professor
Saint Petersburg Electrotechnical University «LETI», Saint Petersburg, Russia
E-mail: Alex.Iakovlev@mail.ru

Abstract. The purpose of this study is to analyse the methodological aspect of the relationship between the fundamental economic categories of «competition» and «money» throughout the twentieth century. The author polemises with the position of Alfred Marshall and Friedrich von Hayek on Gresham's law as a specific form of monetary competition. The main results of the study include the positioning of the Russian Central Bank's digital rouble as a digital form of the state treasury bill, which allows, in the author's opinion, to correctly describe the specifics of competition in the field of digital currency. The digital rouble or digital treasury note is the highest but digital form of fiduciary money issued by the state, represented by the Central Bank. The digital rouble is not credit money but fiat money, although the paper banknote (cash) combined and still combines fiat and credit money. The digital rouble (Fiducia) on the Central Bank's IT platform is theoretically and technically capable of replacing both paper cash (Fiducia) and digital non-cash (Fiat), as it is a version of a form of national currency that combines the properties of cash and non-cash roubles and performs the functions of money as a measure of value, means of saving and means of payment. At the same time a Bitcoin is a return to commodity money, only in digital form. Bitcoin is highly competitive and capable to replace CBDC in all its versions.

Keywords: digital ruble, competition, money, theory of money, monetary symbol, bimetallism, private money, Central Bank Digital Currency, Bitcoin.

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Introduction

Competition between producers and consumers, despite never was defined as a fundamental economic category permeating, according to the classics of political economy (sic !), the whole system of capitalism, is the life-giving medium or the force pushing humanity if not to happiness, then to well-being and progress. As known, competition "under capitalism is a struggle between capitalists for the highest profits" (Investor's Encyclopedia, 2022). Competition on the market is the ideal model of capitalism's ideal economy, a model of an effective mechanism for the spontaneous regulation of social reproduction, where everyone is equal, subordinated to a common goal and therefore happy.

Money is fundamental and debatable economic category; it is the same "mechanism of spontaneous regulation of social reproduction" (Titova, 2008), but in mainstream theory limited to the sphere of exchange (or rather, circulation). At the same time, money is often defined as a kind of "veil" over the system of relations, according to Alfred Marshall "money can certainly be compared to the oil used to ensure the smooth running of a machine" (Marshall, 1923). Thus money is one of the cornerstones of the economic infrastructure of modern civilisation.

Main Part

We try to understand the connection, or rather the evolution of the connection between these two fundamental economic concepts. Obviously, both of these categories evolved. As for the definition of "competition" in general, we will not discuss it. Competition is expressed in some forms. We tend to describe the problem of competition from different points of view. In particular, between the actors and products on the market.

Economists tend the traditional rhetoric. Competition between private producers, i.e. the actual production of these very commodities, has been relevant since the days of Adam Smith and David Ricardo.

But the picture changes dramatically if we take the seemingly inextricable relationship of commodity and money, expressed in the famous metamorphosis product-money-product and competition [in the market (?)] of money according to Pierre le Pesant, Sieur de Boisguilbert (Bouagilbert, 1973) and Thomas Gresham (Burgon, 1839). Although they both are not mentioned in the seminal monograph "Competition and Currency", which is devoted to competition and money itself (White, 1989).

Alfred Marshall. Discussion

We consider this neoclassic as a mainstream methodology. The subject/object of Alfred Marshall's major work "Principles of Economic Science" (Marshall, 1983) was the competition between the supply and demand of a good (not a commodity, but a good), so there is no analysis of money in it. The scientist divided the commodity-money relationship into a good and replaced the category "money" with "marginal utility". It is the famous principle of the classical dichotomy.

At the same time, Marshall's monograph "Money, Credit, and Commerce" (1923) contains a section on the actual competition of money – "Gresham's Law". The main idea of this law is "a weaker currency, if its quantity is not limited, will displace a stronger one" (Marshall, 1923). Two chapters of this paper named "Metallic Money" deal with bimetallism, one section deals directly with Gresham's Law. Marshall notes the experimental nature of this law, obviously supported by facts over many centuries: "The best [coins] will disappear [from circulation] first, then [disappear] the less valuable ones; the worst ones will remain. This is the essence of Gresham's law" (Marshall, 1923).

At the same time, he noted that "Gresham's Law has often been presented as a paradox" (Marshall, 1923). Competition, although not named by the scientist (quite deliberately), is working, but it is working in the wrong direction, in an unnecessary way.

The point is that market players benefited from the seizure of the metal coin, and counterfeiting it also benefited, otherwise both would not have happened on an industrial scale. The benefit is that the value of the material, the metal itself, is sometimes higher than the denomination indicated on the coin. But the denomination in monetary units is not set by the market, but by the issuer.

Thus, the Gresham's law is the contradiction between form (monetary sign) and content (exchange value), between the value of the material of commodity money and the denomination, which turns a piece of metal into a coin as a monetary sign. For some reason Marshall does not write about it. Also he do not mention that counterfeiting is the opposite process to Gresham's law, is closely related to it economically and is also a peculiar form of competition. How Marshall's allegory is put into practice that "when the sea level falls, the highest stones are the first to emerge from the water" (Marshall, 1923). However, the issuer by changing the content of the monetary metal lowered the value of the coin below its nominal value. Although private individuals, i.e. ordinary counterfeiters did this. This was provided by the technology of minting commodity money. This economical policy prevailed in the Middle Ages.

Furthermore, continuing the analysis of Gresham's Law, and in fact the analysis of the competition of currency, Marshall mentioned bimetallism. Throughout the 19th century there was a heated debate about the role and place of this phenomenon in economics, politics and social life, in which Marshall took an active part, but bimetallism in terms of Gresham's law was not paid great attention. This is the foundation of the statement that at first "gold would be the inferior metal" and then, when the exchange rate changes, "silver would appear as the inferior metal" (Marshall, 1923). It is worth noting that bimetallism is very interesting phenomenon.

It is not still clear the role of bimetallism in the field of competition. Although the very fact that the problem of bimetallism is mentioned in the context of an analysis of Gresham's law defines bimetallism as a form of competitiveness.

But examples made by Alfred Marshall on gold and silver are inappropriate, because they were at the time equivalent monetary metals, i.e. money. Therefore they could not force each other out of circulation, only a change in the ratio or exchange rate between them was possible. Silver and gold were forced out of circulation not by Gresham's law, but because of the enormous development of production.

The problem of money competitiveness in the period of neoclassics is not solved. The neoclassical methodology has essentially been based on commodity money since Alfred Marshall's time and still is, although Marshall's work, published in 1923, was by then already morally obsolete, the principle was based on the gold standard (Irving Fisher, for example, is mentioned as the author of the index).

According to Gregory Mankew's "Principles of Econometrics" (Mankew, 1999), examples and simplifications refer to microeconomics or neoclassics built on commodity money and a macroeconomics built on fiat money. Marshall devoted two of the six chapters in his work "Money" to metal money. Marshall's analysis is largely limited to fluctuations of the supply and demand at the money market. But this is rather a problem of macroeconomics, i.e. economic policy than the economic theory.

Finally, noting that "Gresham's Law has been considered usually in relation to metal currencies", the scientist argues that for paper currencies the "opposite tendency prevails" (Marshall, 1923). Thus, according to Marshall, "with regard to banknotes issued by banks" (Marshall, 1923) competition works properly, i.e. paper money displacing.

There is important for undestanding phrase: The opposite trend prevails for banknotes issued by banks. Without effective government control, any one of them is not legal tender and will lose [the public's] trust, which means going out of circulation". "Gresham's Law has been considered generally in relation to metallic currencies: it represents a tendency to take good coins out of the currency. The opposite tendency prevails in regard to notes issued by banks, without effective Government control: for any, that are not legal tender and fall into disrepute, cease to circulate" (Marshall, 1923).

For simplicity, consider that fiat money is represented by paper notes. Gresham's law reflects the specific competition of currency in metal having so-called "intrinsic value". There was a competition between coins and commodity money signs.

The banknote, as we know, is by definition a surrogate or a "token", a sign of a thing, its symbol, a simulacrum. The banknote appeared because for a long time it was just a bill of exchange, evidence that there was gold somewhere (as money, of course, not just as a commodity). The commodity money – gold and silver coins in circulation got a duplicate, at the time paper money. In a century paper money will have an electronic or digital duplicate.

The banknote as a paper token is not just an exchange instrument; it has a dual structure. On one hand there is fiat, i.e. bank money, and on the other hand there is fiducia, i.e. state money, for clarity, the Central Bank's money. These are different types/species of paper money, which have different economic nature.

Gold and silver in terms of economics and as currency have absolutely equal value. Whereas Fiat commercial bank money (capital in money form) and Feducia central bank money have a different economic nature. We consider the issue of competitiveness between them paying attention to the change in exchange value. We possess there is not only competition within one form of currency (Gresham's law), but also competition between different forms of exchange value. For example, Au versus Ag (commodity money), at the same time Fiat versus Feducia (paper money) and Bitcoin versus Ethereum (crypto money). These qualitatively different types of competitiveness are often not distinguished, i.e. confused.

So in Alfred Marshall's sacramental phrase there is a clear contradiction, which creates ambiguity, although for the late 19th century this is forgivable. The scientist speaks of a consistency of "banknotes issued by banks", i.e. there are many issuers and they are undoubtedly private individuals. However, in order to compete, banknotes from different banks must differ in some way. If there is an absence of difference by quality or quantity, there no the subject for assessement leading to the absence of competitiveness. At the same time, banknotes as money should be fully fungible (exchange and redemption), i.e. they should not differ in any way (economically) from each other (only different banknote numbers and denominations). The contradiction is that there is a unique bank document (content) and at the same time there is a universal monetary sign (a coin).

According to the first chapter of Marx's Capital (Marx & Engels, 1960), the idea that money is the result of competition is implicit in under the title "Commodity". Marx introduced forms of value. Karl Marx's change in the form of exchange value is a logical development from commodity to money (product -> money). Karl Menger supported the same idea. But the founder of the Austrian economics school, Menger gives, only a historical description of the process. In fact, he gives a brief history of the evolution of money circulation, or rather, the evolution of the monetary sign (Menger, 2005). Thus, Menger did not say anything new in the theory of money, only described the facture of the process. Menger is credited with the introducing the term "saleableness" (Menger, 1892) of a commodity. Now we use the term "liquidity", although it is the same thing.

There is an issue of a presence of specific forms of competition (in the market) for modern money and the functioning of Gresham's [competition] law work for commodity money, but not for its paper counterparts. As we can note, in practice it is not the banknotes themselves which "win", i.e. the "best" or "strongest" banknotes remain in circulation, but the banks which issue them.

Marshall's considered fiat money, i.e. a stronger (stable) bank issues a stronger promissory note, i.e. a receipt for a real coin. It was important to get it before the bank went bankrupt. In this case Marshall is right. He is wrong in comparing private bank notes, surrogates, tokens with metal money or to the money metals themselves. These are qualitatively different elements of the monetary circulation system in the era of the gold standard.

It is also interesting that while the consumer uses money (M) as "just" money (in the commodity market), the producer uses capital (C) in monetary form M (in the capital market), and these are other regularities, although in both cases there are metamorphoses (transactions) money-product and product-money. Microeconomics textbooks describe simple commodity production, and their authors are economists of the late 19th century, while macroeconomics is closer to reality, it is already capitalism in the early and mid 20th century. This creates confusion in mainstream textbooks.

In contrast to the neoclassical positions, it is not money but monetary (including potential) signs that really compete. Having reached a high point (face value on a coin), competition within the gold standard took on localised forms for a long time by the Gresham's law.

Also there is an issue about the primordiality of capital or money. Of course, money is primary. If debt is primary, in spite of the really significant role of the state and all the findings and transitive forms found by modern anthropology, we have to admit that capital is primary, and this is totally absurd. Although popular authors, like David Graeber (2016), do not understand this for some reason, manipulating the polysemy of the words.

Friedrich von Hayek. Discussion

So, according to Marshall, competition in the market for metal money is wrong, and competition in the market for banknotes, i.e. paper money, is right. The same idea is highlighted by Friedrich von Hayek in his monograph "Private Money" (Hayek, 1976).

In our opinion, Hayek's work is an economic utopia, which cannot be called an academic work in the same way as Tommaso Campanella's "City of the Sun" or Thomas More's "Utopia."

Hayek's theory of private money (and the competition between them) is a utopia, unrealisable in practice, an economic fiction, based on the idea of a return to the gold standard, a return to "yesterday", to simple commodity production.

As ingenuously admitted in the preface to the publication of the work in Russia translators, and they are venerable and authoritative then (mid 90's) V.A. Naishul and G.G. Sapov, "its ideological basis is simple ... Currency should be considered a common commercial product and therefore produced by market way" (Hayek, 1996). This glaring methodological miscalculation turns the scientist's work into a utopia. The same utopia was the discipline of "scientific communism" taught in higher education institutions in the USSR.

The "money is just a commodity" thesis is understandable to the common man, which is why Hayek's work was so popular among the crypto-enthusiasts of the first wave, there is a lot of alleged evidence for it, i.e. seemingly convincing examples and analogies. For the expert, this thesis should seemed to shock, but Hayek's "theory" found a large following among academics, which is surprising. So, we can define it as utopia.

It was also proved in practice.

The chapter with the characteristic title "The confusion around Gresham's law" is largely devoted by Hayek not to competition of money, but to criticism of William Jevons, who declared: "there is nothing less suitable for competition than money" (Hayek, 1976). According to Hayek's version, "the eminent economist W.S. Jevons" misunderstood Gresham's law; he, "like many others, overlooked or considered it immaterial that Gresham's law applies only to different kinds of money, the firm exchange rate between which is set by law" (Hayek, 1976).

Hayek tries to prove that competition is always a good thing, even between incomprehensible "kinds" of money. It turns out that Gresham's "wrong" law is only a special case, an exception to Hayek's theory. All it takes is a change in legislation and life gets better. But it is inachiveable task.

You can use my monograph (Yakovlev, 2020); here I will only briefly list a number of fundamental flaws of Friedrich von Hayek.

1. Gresham's law does not apply to "various kinds of money" in general, but only to monetary units with a so-called "intrinsic value", i.e. it only applies to specific metal coins, in fact the law works piecemeal. The same kind of money may contain coins of the same denomination, but with different metal content.

2. The state, on the one hand, used the contradiction between the face value (form) of a coin and its content (weight of metal), but, on the other hand, if we talk about types of money, had to somehow regulate the contradiction, which constantly broke through the mass discontent and even revolts.

3. "Good competition" according to Hayek works like this: "...at floating exchange rates, money of worse quality will be valued less and people will try to get rid of it as quickly as possible, especially if there is a threat of a further drop in its value. The selection process will continue until people come up with the best kind of money among those produced by different agents" (Hayek, 1976). Hayek deliberately avoids to mention whether the money in question is metal or paper one. It can be assumed that this is indifferent, although Gresham's law does not work for paper money, and according to Marshall's version it works "the other way round". In fact, what is meant here is metal money.

4. In fact, Gresham's law implicitly incorporates Hayek's "floating exchange rate", or rather it guides it by making good coins out of circulation. It was technically impossible for the state to provide an official "floating rate" in practice at the time. Most importantly, it was often simply not profitable for the issuer. We consider, that, according to Hayek and his adherents, it is impossible to account a "floating rate" for the metal content of each particular coin.

5. "The selection process", i.e. the competition of private money according to Hayek, involves some kind of mechanism. At first the scientist claims "Now we have to investigate the selection process itself and the criteria according to which it will be made". But then he warns: "This is an issue on which we have very little empirical knowledge" (Hayek, 1976). The author does not further explain how this process should be carried out. But it is obviously that he suggests to set up several central banks instead of establishing a single central bank in one country.

6. Friedrich von Hayek does not mention the costs accompanying the issue of private money. If there is competition, its main mechanism is the balancing of revenues and costs, and one of the main methods of competition is cost reduction.

7. Regarding the originality of Hayek's idea ("to the best kind of money among those issued by different agents") it is worth noting that Dumas' novel "The Three Musketeers" mentions Paris at the beginning of the 17th century where Spanish doubloons (aka pistoles) were in circulation.

For example, the chapter "Limited Historical Experience with Parallel Currencies and Trade Coins" (Hayek, 1976) is devoted to the analysis of commodity currencies. But the next chapter of the scientist "The introduction of private banknotes" mentions the "private Swiss ducat" as a type of paper banknote (Hayek, 1976), for which Gresham's law does not really apply, except for the quality of the printing and the number of degrees of protection (eight or ten) of ducats and the reserve currencies for it.

Also Hayek mentions the senorage only once, when "the duty intended to cover the cost of minting coins proved to be a very attractive source of income...", (Hayek, 1976) or the income of the issuer is a necessary incentive to issue banknotes and their substitutes, otherwise there is simply no point in doing this business. Hayek does not mention the most important interest for the capitalist – income.

Hayek's "Private Money" is a utopia where academics have been given essentially only one simple but a fundamental question: if a private issuer of currency, the Central Bank, is possible, why only one?

The foundations of modern monetary, banking and financial systems have shaped the banknote as a medium of circulation. It originated as a simple bill of exchange, i.e. a security and a financial instrument. The "new money" of capitalism did not emerge easily. They emerged as an active tool, if I may say so, in some of the most adventurous business projects of the time.

But just as gold defeated all other banknotes in a thousand-year competition, so the banknote, from an embryo of fiat money, a kind of hybrid of money – product (proto-money and proto-action together), moved by touch and finally, in a couple of centuries, became "universal means of payment", or into a legal tender, which Hayek tried to fight against, while finally getting rid of the rudiments of the security or the 17th-century bill of exchange (the possibility of exchanging it for gold) only in 1971.

Nevertheless, in today's monetary system gold is the last reserve and the Central Bank is the lender of last resort. Together they must save if necessary the national monetary system from default, i.e. collapse.

Competition versus money in the twenty-first century. Discussion

Competition between cryptocurrency and banknotes is an endless stream of publications, most of them written by mainstream representatives who categorically do not recognise bitcoin as money even in future. We consider this issue in brief.

The first paper price tag is thought to have appeared in 1870. Symbolically, the timing of its emergence coincided with the "margin revolution". Those time theory was way ahead of practice. Now, on the contrary, money theory lagged the revolutionary practice of entrepreneurship, and is not really needed.

The monetary system, or rather the banknote system, has in practice made a technological breakthrough over the last couple of decades of the 21st century: from a paper standard to a digital one. There is important that the evolution of currency is taking place. It allows to define a spiral development, considering a version of the evolution of money as Gold (Aurum) – Paper (Fiat/Fiducia) – Digital &Crypto (Bit Gold).

At the beginning of the new century, the world learned what Bitcoin is, and electronic payment systems (EPS) became firmly embedded in our lives. There is an issue of competitiveness between the EPS. But we can not use Gresham's Law for its assessment. EPS are money delivery services, a practical but not theoretical instrument. But by the theory of money EPS is nothing more than a surrogate which cannot exist on its own. In the early days of digitalization, there were attempts to think of EPS as the "new money", a competitor to old ones (Kochergin, 2006) but time shows that it is only a transitional technological form, a precursor to a real breakthrough. We can make the analogue with the pager that was once a precursor, and even for a time was considered a competitor to modern mobile communications.

If we continue Friedrich von Hayek's reasoning, the production of money "as a commodity" operates today within the centralized two-tier model established at the beginning of the twentieth century. The money generator is the state enterprise "Central Bank" and a system of national commercial enterprises, i.e. private banks, strictly regulated by both legislation and market instruments. The Central Bank is the mega-regulator of a financially rigidly centralized system. The production of money as a commodity in practice involves capital, this business has an obvious beneficiary. In this case, the generator bears all the inherent benefits and risks of such a specific business. The consumers of the money supply as a commodity are individuals and legal entities (non-financial companies).

Because of its comprehensive development, the monetary system is now represented by a whole scale/ line of monetary aggregates: M0, M1, M2, M3, etc. Money now includes both explicit money surrogates as product and money so as the explicit financial instruments – money and competitiveness. Cash itself, i.e. M0, and the various instruments of the banking/financial system form the incomprehensible money supply (actually it is capital in monetary and non-monetary form). Thus, we can note Hayek's and Thomas More's utopia slightly correct.

The conflict between theory and practice, established by Marxism and neoclassics, generated significant confusion, which led to a kind of revolution in terminology while the original concepts did not disappear. Also it led to wide use in economic theory of surrogates, literally "rubber" categories while the original concepts remained: benefit – instead of the category "goods", including money, liquidity instead of the category "money" and all its derivatives and substitutes, and again, benefit (but of the second order) instead of the category "capital". Models have replaced dialectics in science (another confirmation of Gresham's law), e.g. the concepts of "capital in money" and even "financial capital" have virtually disappeared from science

The immense range/spectrum of money theories from the Austrian school and Marxism to the current adherents of the Modern Monetary Theory by Ray Dalio (2019) is only a consequence of this confusion.

Conclusions

The individual, the person with a smartphone in his hands today is in many ways a mini-bank, if you will. Many of the traditional bank functions are now performed by the user themselves, they do not need to go to an office to carry out a transaction or take out a loan, for example. This became technically possible when the financial system, or rather the single financial network, became so comprehensive and reliable that not only the B-to-B segment, but also the B-to-C (retail) segment, which could only be served by private banks in their offices, can now be served online. So, working with millions of individual users has become technically possible as part of a single national financial platform.

The long partnership between business and government in the frame of the two-tier monetary model-Fiat/Fiducia-has been called into question over the past few years. The Central Bank Digital Currency (CBDC) firstly was discussed in theory and now actively implemented in practice.

CBDC in its Russian version of the "digital rouble" (Bank of Russia, 2020) is the ultimate or digital form and the near future of the Russian monetary system. For half a century SWIFT organized in 1973 as a messaging/payment system between banks was developed as an instrument of non-cash settlements, the digital bank bill was developed and strengthened on the basis of advances in IT technology, today (in Russia from 2018) the same IT technology has enabled the Central Bank's national monetary system to be theoretically and practically launched.

There is a fundamental scientific, practical and even terminological issue of replacing (or "displacing" by Gresham) CBDC or its Russian version by the "digital ruble".

Obviously, the digital rouble, unlike Bitcoin, is not a form that creates a new "money market". At least directly, whereas the indirect effects are the subject of a separate discussion, although as yet they are hardly analysed. So there will be a substitution of existing money forms. "The intrigue is whether it is non-cash or cash" (Dostov, 2022). So, there is an issue of prevailing of cash (the M0 aggregate – a paper treasury note issued by the Ministry of Finance under the control of the Central Bank) over non-cash or replacing by the digital rouble. This analysis was prompted by Victor Dostov's article, in which the author states: "Gresham's law – 'the worst money crowds out the best' – still works (Dostov, 2022). The modern two-tiered monetary, or monetary, or banking system stands on two foundations – Fiat+Fiducia. The bank note and the state treasury note merged in a single paper banknote for many decades.

The digital bank bill has actually been around for decades, too. It appeared at the same time as on-line means of communication. It was a part of SWIFT system so as the digital treasury notes and other kinds of digital money.

But the digital rouble or digital treasury note is the highest but digital form of fiduciary money issued by the state, represented by the Central Bank. The digital rouble is not credit money but fiat money, although the paper banknote (cash) combined and still combines fiat and credit money

The digital rouble (Fiducia) on the Central Bank's IT platform is theoretically and technically capable of replacing both paper cash (Fiducia) and digital non-cash (Fiat), as it is a version of "a form of national currency" that "combines the properties of cash and non-cash roubles and performs the functions of money as a measure of value, means of saving and means of payment" (Rodina, 2021). The implementation of the project, its volume and terms depends on the balance of economic, political and even geopolitical interests of the parties concerned.

Thus a Bitcoin (Bit gold) is a return to commodity money, only in digital form. Bitcoin is highly competitive and capable to replace CBDC in all its versions. That's quite interesting.

References

1. Akademik. (2022). *Investor's Encyclopedia*. Retrieved from https://investments.academic.ru/1056/Competitiveness (accessed 30.08.2022) (in Russian).

2. Titova, L. A. (2008). *History of Economics*. Yaroslavl: K. D. Ushinsky State Pedagogical University. Retrieved from http://cito-web.yspu.org/link1/metod/met79/met79.html (accessed 30.08.2022) (in Russian).

3. Marshall, A. (1923). *Money, Credit & Commerce*. London: Macmillan & Co., ltd.

4. White, L. H. (1989). *Competition and currency: Essays on free banking a. money*. New York; London: New York univ. press.

5. Marx, K. & Engels, F. (1960). *Collected works. 2 ed. V. 23. Capital*. M.: Gos. izd-vo polit. literatury (in Russian).

6. Menger, K. (2005). *Selected Works*. M.: Territoriya buduschego (in Russian).

7. Hayek, F. A. (1976). *Denationalisation of Money: An Analysis of the Theory and Practice of Current Currencies*. London: Institute of Economic Affairs.

8. Hayek, F. A. (1996). *Private Money*. V. A. Naishul, G. G. Sapov (Eds.). M.: Institut nacional'noy modeli ekonomiki (in Russian).

9. Yakovlev, A. I. (2020). *Theory of money: from gold to the cryptosystem of exchange*. SPb. (in Russian).

10. Kommersant. (2022). *D'Artagnan and the three louis. How much the Musketeers earned and spent*. Retrieved from https://www.kommersant.ru/doc/2821012 (accessed 30.08.2022) (in Russian).

11. Kochergin, D. A. (2006). Monetary competition in conditions of electronic money circulation. *Vestnik SPbGU. Ser. 5*, (3), 20-29 (in Russian).

12. Bank of Russia. (2022). *Monetary aggregates*. Retrieved from https://cbr.ru/statistics/macro_itm/dkfs/monetary_agg/ (accessed 30.08.2022) (in Russian).

13. Dostov, V. (2022). Do crypto have a chance, or does Gresham's law still work. *Business Excellence*, (7), 22-25. Retrieved from https://be.profkiosk.ru/981881 (accessed 30.08.2022) (in Russian).

14. Bouagilbert, P. (1973). *Discourse on the Nature of Wealth, Money and Taxes*. Bitter.

15. Burgon, J. W. (1839). *The life and times of Sir Thomas Gresham*. London: R. Jennings. Retrieved from https://archive.org/details/lifetimesofsirth01burguoft (accessed 30.08.2022).

16. Marshall, A. (1983). *Principles of Economic Science: in 3 vols.* M.: Progress (in Russian).

17. Mankew, N. G. (1999). *Principles of Economics*. SPb.: Piter Kom (in Russian).

18. Graeber, D. (2016). *Debt: The first 5,000 years of history*. M.: Ad Marginem Press (in Russian).

19. Ray, Dalio. (2019). *It's Time To Look More Carefully At «Monetary Policy 3 (MP3)» And «Modern Monetary Theory (MMT)»*. Retrieved from https://seekingalpha.com/article/4260457-time-to-look-carefully-monetary-policy-3-mp3-and-modern-monetary-theory-mmt (accessed 30.08.2022).

20. Rodina, G. A. (2021). Old analogue normality vs new digital normality in a competitive coordinate system. *Journal of regional and international competitiveness*, *5*(4), 4-12. Retrieved from http://jraic.com/index.php/tor/article/view/61/53 (in Russian).

21. Bank of Russia. (2020). *Report for public consultation "Digital Ruble"*. Retrieved from https://cbr.ru/analytics/d_ok/dig_ruble (accessed 30.08.2022).

22. Menger, C. (1892). On the Origin of Money. *The Economic Journal*, *2*(6), 239-255.

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