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Digital Gold Ruble as an Alternative to the Dollar

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ABSTRACT

The paper examines the advantages and disadvantages of the third form of Russian currency that is currently being tested by the Bank of Russia — the digital ruble. The research methodology is based on the postulates of liberalism and the concepts of the Austrian school of Economics. Correlation and regression analysis were chosen as the research tools. The purpose of this article is to support the need to expand the monetary functions of the digital ruble that is being created by the Bank of Russia. According to its creators, it should become a convenient payment method. However, in order to accelerate the innovative growth of the Russian economy and overcome the currency blockade of the Russian Federation by unfriendly countries, the author proposes to strengthen the monetary functions of the Russian digital ruble as a store of value and a world currency. To achieve this goal, it is suggested to back the digital ruble with gold reserves. This proposal was made based on a statistical analysis of the profitability and risk of several potential collateral assets. It was found that gold has an average annual return of 12% from 1971 to 2023. The paper concludes that gold is the best option for collateral because it has a stable, positive return and low risk of price fluctuation, as well as constant purchasing power. Therefore, the creation of a digital ruble backed by gold seems quite realistic and economically justified. Such a third form of the Russian currency, which combines the best features of cryptocurrencies, paper money, and commodity money, could potentially create real competition for the US dollar in the Eurasian region.

Keywords: reserve currency; gold standard; expected return; currency risk; fair value; money circulation; economic growth

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INTRODUCTION

According to the Bank of Russia, in the next two years, a new type of money, the digital ruble, is expected to be introduced in our country. This will add a third type of national currency to the existing cash and non-cash forms of payment. Let us take a closer look at the strengths and weaknesses of this new form of Russian ruble and explore whether its introduction could contribute to improving the investment climate in Russia and, consequently, accelerate economic growth.

The advantages of the new payment technology,[1] which are listed on the official website of the Central Bank of Russia, include a significant reduction in the risk of losing digital rubles due to the fact that accounts will be opened on the Bank of Russia's platform, rather than in commercial banks. This means that digital wallets will be safer and more secure.

Another advantage of the digital ruble is that it will allow users to make payments even when there is no internet access. Additionally, users will be able to access their digital wallets through any bank that services their funds.

With each digital ruble having a unique identification code, the government, tax authorities, and law enforcement agencies will be able to more easily track cash flows and control budget spending. This will also make it easier to collect taxes on transactions.

According to the Russian financial authorities, the digital ruble is intended to incorporate the best features of cryptocurrencies:

- the ability to conduct transactions at any time;
- no fees for cross-border payments;
- convenience of making payments.

However, the digital ruble will also be free from some of the significant drawbacks of modern cryptocurrencies, such as:

- high volatility of exchange rates;
- lack of a central authority responsible for maintaining the value of the cryptocurrency.

[1] Website of the Central Bank of Russia. URL: https://cbr.ru/fintech/dr/ (accessed on 10.06.2024).

The digital ruble is being developed as an advanced payment method that is more efficient than existing ones. The Central Bank of Russia wants to be part of the global transformation of the payment system, which is associated with distributed ledger technology. Although some central bank leaders have criticized cryptocurrencies, calling them monetary substitutes [1], they have not stopped the growth of these digital currencies. Scientific and technological progress cannot be stopped, and central banks must lead the way in this new era of digital payments.

However, despite its advantages, the digital ruble has several significant drawbacks that could significantly limit the number of potential users for this new form of currency. These include, most importantly, as mentioned by the Central Bank[2];

- no interest accrual on the remaining funds in digital wallets;
- the absence of the usual cashbacks when buying many goods on the Internet.

This may alienate pensioners (the main saving stratum of our society) and young people who make the vast majority of their purchases in the field of online commerce from the digital ruble. The Bank of Russia will not charge a commission for payments made by individuals in digital rubles, and legal entities will be charged a commission of 0.3% of the transfer amount, which is significantly lower than payments for modern acquiring from 1% to 2.5%. However, taking into account inflation and the lack of accrual of income on the remaining funds in digital wallets, the profitability of digital rubles for their owners will be negative. In addition, loans will not be issued in digital rubles, which will also reduce the range of potential users of this new form of rubles. But the most important drawback of the digital ruble, as well as the cash and non-cash ruble money supply, is that the digital ruble will not perform one of the most important monetary functions — a means of saving. To prove this statement, we quote from the famous work of J. R.R. Tolkien. According to Keynes, "If the act of saving does not increase the expected income in any way, then it will not stimulate investment" [2, p. 199]. In this regard, as the main purpose of the study, the article considers the rationale for the need to expand the monetary functions of the digital ruble, in particular, it is proposed to provide the digital ruble with gold. Therefore, it would be interesting to analyze the experience of issuing digital currencies by foreign central banks in order to find a definitive answer to the question: to what extent the advantages of these assets prevail over their disadvantages and the costs of implementation.

LITERATURE REVIEW

Recent developments in cryptography and distributed ledger technologies have created significant opportunities for the adoption of digital currencies. While private currencies such as Bitcoin and Ethereum have led the way in this area, central banks have been actively exploring the benefits and risks of introducing their own central bank digital currency (CBDC) over the past decade. CBDC is a new form of electronic money issued by central banks that can be accessed by a wide range of users [3]. CBDCs can be offered as digital wallets at the central bank to all households and corporations. With the help of these accounts, it will be possible to perform the usual functions of accessing funds and paying for purchases that are inherent in demand deposit accounts in banks. As U. Bindseil points out [3, p. 304], "commercial banks will provide services for exchanging bank deposits in CBDCs for banknotes, charging a competitive commission". Digital currency can eliminate the cost of processing physical cash, which in many countries is about 1% of GDP [4].

The authors of scientific articles on the CBDC (central bank digital currency) issue can be roughly divided into two groups: those who support the introduction of new digital currencies by central banks, and those who are concerned about the potential negative consequences of CBDC's introduction into the economy.

[2] Website of the Central Bank of Russia.URL: https://cbr.ru/faq/dr/ (accessed on 15.05.2024).

The first group includes B. Dyson and G. Hodgson [5], who argue that switching to CBDC could make the financial system more secure, as it would allow economic agents to settle transactions using central bank money rather than commercial bank deposits. They believe this would reduce the risk of systemic failure and increase transparency in the financial system.

Transparency in the movement of digital currencies will contribute to the fight against money laundering, terrorist financing and tax evasion [6], and the costs of issuing digital currencies will be significantly lower, since their issuance, circulation and storage are digitized. J. Barrdear and M. Kumhof [7], using the DSGE (Dynamic Stochastic General Equilibrium) model, It is estimated that the CBDC issue can increase GDP by up to 3% by lowering real interest rates.

The People's Bank of China (PBoC) is testing its digital currency electronic payment system in four cities: Shenzhen, Suzhou, Chengdu, and Xi'an, with the participation of four large state-owned banks. The goal is to issue digital assets[8]. China's new digital currency has the potential to challenge the US dollar as the main reserve currency and change the national and international monetary systems.

There is a significant difference between cryptocurrencies and China's digital yuan. While cryptocurrencies rely on a decentralized blockchain network, the Chinese digital currency will be controlled by the government. This gives the Chinese government unprecedented control over the economy.

The global financial crisis of 2008 highlighted the risks of relying too heavily on the US dollar. China is therefore seeking to move away from the dollar-based global financial system and create a more stable and independent monetary system.

In mid-2016, the Bank of Canada announced plans to launch its own digital currency. This decision was made with the aim of ensuring that the Canadian financial sector remained competitive and aligned with global trends in digital finance [9].

In Sweden, the central bank plans to begin pilot testing of the e-krona (digital crown)[3] cryptocurrency. Among the goals of creating this cryptocurrency at the state level is to offer alternative means to the private digital market.

The Bank of Japan excludes the creation of its own CBDC in the short term due to the fact that cash circulation and payments in cryptocurrencies[4] are quite widespread in the country.

The Singapore government also does not see the current need for a CBDC.[5]The Reserve Bank of Australia (RBA) holds the same opinion, as little demand for CBDCs from households is predicted.[6]

The Central Bank of Israel (BoI) will not implement a CBDC in the near future, as there is no certainty about the success of this operation. The main reason is that "CBDCs are similar to current electronic payment systems, and both are convenient and affordable".[7]

Therefore, there is no clear advantage for digital currencies compared to the already existing non-cash money. In addition, the use of cash in Israel has only been increasing in recent years, which seems to further motivate the BoI's position not to create a CBDC, at least in the short term. In addition, it is beneficial for the state to issue paper money into circulation, because income from seigniorage is still relevant [10].

All authors who publish articles on new digital currencies agree that the issuance of a central bank digital currency (CBDC) can change all aspects of the monetary system, acting as a free medium of exchange, a secure means of saving and a stable unit of account, benefiting consumers [11]. In general, the introduction of

[3] Website Sveriges Riksbank. URL: https://www.riksbank.se/en-gb/payments-cash/e-krona/e-krona-reports/e-krona-project-report-2 (accessed on 11.04.2024).

[4] Bank of Japan. URL: https://www.boj.or.jp/en/research/wps_rev/lab/lab19e03.htm (accessed on 11.04.2024).

[5] Singapore Government. URL: https://www.mas.gov.sg/news/speeches/2018/the-postcrisis-financial-landscape-what-next (accessed on 12.06.2024).

[6] Reserve Bank of Australia. URL: https://www.rba.gov.au/monetary-policy (accessed on 11.04.2024).

[7] Bank of Israel. URL: https://boi.org.il/en/economic-roles/payment-systems/future-payment-methods/digital-shekel-cbdc (accessed on 11.04.2024).

a CBDC can have profound implications for the implementation of both monetary and banking policies [12]. Digital currency is not just about digitizing a currency and moving it online: a new form of currency will make money smarter [13]. Smart contracts based on digital currencies can be executed automatically and reliably, which provides technical solutions to reduce the risks of contract default and credit default, which will be the direction of CBDC development in the future. Digital currencies are considered by economists as monetary instruments that can limit the risks of a sudden increase or decrease in bank loans to the real sector due to the creation of bank deposits out of nothing, which led to numerous financial crises during the first two decades of the new millennium [14].

However, the emergence of central bank digital currencies will also bring significant risks to the two-tier banking system. The second group of researchers who have a negative attitude towards the emergence of a new digital form of currency is U. Bindseil [3]. He notes that the main risk associated with CBDC issuance is the risk of structural termination of commercial banks' intermediation, which consists in reducing their balance sheets due to large-scale migration of funds from bank deposits to CBDC. Skepticism about the innovative properties of the digital ruble is also expressed in the work of M.A. Abramova, N.N. Kunitsina and E.I. Dyudikova [15].

Perhaps this is why currently only four central banks have introduced digital currencies: the Central Bank of the Bahamas, the Eastern Caribbean Central Bank, the Central Bank of Jamaica and the Central Bank of Nigeria. There is not a single economically developed country on this list. However, it seems that the process of the digital revolution in money circulation is irreversible, and in order to remain as key financial institutions, central banks will have to create new payment instruments that compete with private cryptocurrencies.

Summing up the first part of the literature review, I would like to emphasize that the advantages of introducing a new form of digital currency still outweigh the current challenges and possible negative consequences of CBDC, in my opinion. The Bank of Russia is not wasting time, unlike many central banks in developed countries, by distancing itself from the process of digitizing the national payment system, under the pretext that it needs to conduct additional research. Instead, it is actively engaging in this process. In fact, it is just pausing and observing how this process is progressing in other countries.

In the coming years, complete digitalization of the financial market, and particularly banking, is inevitable. Therefore, keeping up with the times is a better strategy than trying to quickly catch up.

As for providing the digital ruble with gold, it is worth noting that the idea of linking modern currencies to any liquid asset is not an anachronism. Due to the rapid growth of public debt in the United States, which exceeded $38.5 trillion, and high, by American standards, inflation, publications have become more frequent in the scientific literature [16] related to research on the possibility and expediency of returning the gold standard in this country. N Asquin [16] argues that an "honest gold standard" is the solution to the problem mentioned above, and will also save society from price fluctuations and excessive inflation, since gold has intrinsic value. Under the gold standard, the money supply will be limited by the amount of gold in the US reserves, and since it only increases as gold is mined and processed, the annual inflation rate will therefore be low and out of government control. This will prevent the government from spending beyond its capacity, creating a budget deficit. Asquin shows that the gold standard dramatically reduces the likelihood of severe economic depressions and recessions. The main argument in favor of the return of the gold standard in the United States is that gold can guarantee long-term price stability, unlike paper currency.

In the Islamic world, according to Sharia, only gold and silver can be money: "Governments cannot change natural laws such as the law of gravity; they cannot change the nature of money, which originated as a commodity and settled in

gold and silver. There is no known case of a nation achieving great wealth without using gold and silver money. On the other hand, there is not a single example where a nation would try to displace this natural money with the help of paper money without involving itself in distress and difficulties" [17, p. 830]. K.M. Hansen agrees with this statement [18]. He notes that the circulation of fiduciary banknotes everywhere leads to inflation, which contributes to the fact that consumer goods will become worse and worse compared to what would be produced under a more reasonable monetary regime, as impoverished consumers of these goods will be forced to purchase cheaper and lower-quality goods.

In addition, K. M. Hansen discovered another negative phenomenon from the US transition to fiduciary money circulation: the deindustrialization of the American economy. The integration of vast areas of the globe into the global economy over the past few decades has meant that some industries in the United States are simply no longer competitive. Workers and investments will have to switch to other activities where the US still has a comparative advantage. It is impossible to circumvent this adjustment, but there is some reason to believe that "the United States industry has found itself at a disadvantage due to the monetary policy of the Federal Reserve System" [18]. The first sign that something is wrong is the persistent U.S. balance of payments deficit. This would not have been possible under the gold standard. In a world of fluctuating paper currencies, inflation was bound to cause the dollar to depreciate against foreign currencies as its supply increased and its purchasing power declined. However, this has clearly not happened; the dollar's exchange rate is generally stable due to overseas demand for dollars. If the dollar had been allowed to depreciate as a result of the Fed's inflationary policy, it is likely that the stagnation of industry in the United States caused by the emergence of the Chinese economy and its integration into the global economy would not have been so serious for the United States.

In this regard, let us recall how the classics of economic theory and practice of monetary circulation relate to the monetary functions of gold. Early mercantilists understood only precious metals as true money. Paper money is only a shadow of metals. The value of paper money lies in the fact that they represent gold and silver [19].

The new Mercantilists, whose most prominent representative was J. Keynes considered the gold standard to be a barbaric relic of the past. However, this did not stop Keynes from trying to create an international currency for multilateral transactions pegged to gold, which he called a bancor. Unfortunately, his ideas were rejected by the architects of the Bretton Woods system [20].

The most consistent opponents of modern fiduciary money, which is completely unsecured and controlled by central banks, were representatives of the Austrian school of economics. L. Mises in his monograph "The Theory of Money and Credit" wrote: "The advantage of the gold standard is rooted in the fact that it ensures the independence of the purchasing power of the monetary unit from the activities carried out by the state. He snatches their most formidable weapon from the hands of the "economic kings". It makes it impossible for them to unleash inflation. That is why the gold standard is being fiercely attacked by all those who expect benefits from the generosity of the seemingly bottomless state purse" [21, p. 476]. Representatives of the Austrian School of economics are convinced that gold-backed money is much better for economic development than fiduciary money. But the crowning achievement of the development of the global monetary system, in their opinion, will be the transition to competing private money. Back in the middle of the 20th century, the most prominent representatives of this school seemed to foresee the emergence of cryptocurrencies, the formation and rapid development of which we are currently witnessing.

Greenspan, the 13th Chairman of the Board of Governors of the Federal Reserve, highly appreciates the role of gold in monetary circulation: "Without the gold standard, there will be no way to protect your savings from

confiscation through inflation. Gold is the best means of preserving capital".[8] According to A. Greenspan, the gold standard, if it ever returns, will prevent the deficit financing of government spending, i.e. the robbery of the most economically active members of society for the implementation of various social security programs. According to A. Greenspan, this is the reason for the negative attitude towards the gold standard on the part of modern government officials.

Here are a few more striking statements about the gold standard. "Without a gold equivalent, it is very difficult to understand the value of money" [22]. "I am still convinced that as long as money management remains in the hands of governments, the gold standard, with all its imperfections, is the only more or less secure system" [23, p. 106]. "Thanks to the gold standard, the monetary system was in order, everything worked, economic cycles were under control, international trade and investment activities developed freely" [24, p. 98].

Therefore, the idea of returning to the gold standard has been a constant feature of American policy since R. Nixon abolished the system of convertibility of the dollar into gold in 1971. Such calls have consistently been associated with periods of significant social, cultural, and economic upheaval, such as high inflation and high unemployment (stagflation) in the late 1970s. Ronald Reagan's "New Deal" included a proposal to return to the gold standard. More recently, Donald Trump has expressed his enthusiasm for the gold standard, saying that "we will have a standard on which our money will be based" [25], Interest in gold as "a morally correct form of money" has also been on the rise.

The concept of asset-backed digital trading coins is currently being developed at the Massachusetts Institute of Technology [26]. The idea is for banks to issue digital tokens for real assets transferred to them by a consortium of sponsors. These tokens will be quickly and efficiently circulated within a group of users using a distributed registry mechanism. The developers of the new means of payment want to replace physical money with a supranational international reserve currency, isolated from adverse actions by central banks and governments, since it will be backed by real assets.

METHODOLOGY

The analysis is based on the principles of a free market economy and economic liberalism, as developed by the neoclassical school of thought. This school is based on the concept of Austrian marginalism, which denies the leading role of the state and central bank in the formation and development of payment systems.

THE RESULTS OF THE STUDY

In today's globalized economy, there are several reserve currencies. They usually help to carry out calculations on export-import operations, form international currency reserves, and make foreign investments. The Big Economic Dictionary provides the following definition: "Reserve currency is the currency of a country in which central banks of other states accumulate and store reserves of funds for international settlements; national credit money of leading states, which are used to service international settlements" [27, p. 128]. The most important features of a reserve currency include the following: "free conversion, the formation of a market-based exchange rate, confidence in it from market participants and stability against other national currencies" [28, p. 332]. Consequently, even the size of the economy (the value of annual GDP) or the volume of a country's foreign trade are not critical parameters for the international recognition of its currency as a reserve.

A country with a reserve currency has significant advantages in economic development compared to countries whose currencies are not reserve currencies. Such a country can afford to have a balance of payments deficit for a long time, which can be covered at any

[8] Greenspan A. Gold and Economic Freedom. Rand, Ayn. Capitalism: The Unknown Ideal. 1967. URL: https://www.investmentoffice.com/Observations/Beyond_Finance/Gold_and_Economic_Freedom.html (accessed on 10.06.2024).

time by additional monetary emissions, i.e. the population of such a country consumes more goods and services than it produces. A country with a reserve currency earns a huge additional income in the form of seigniorage. For the United States, it is estimated at about 500 billion dollars per year [29]. But most importantly, as the results of the Russian-Ukrainian crisis of February 2022 showed, international reserve currency cash flows are almost impossible to block or confiscate from the issuing country, since the country with the reserve currency has all the necessary financial infrastructure for money transfers, and deposits even for non-residents are open in national banks.

The organization of the production of advanced high-tech products in mechanical engineering and electronics, the creation of new factories and IT hubs like Bangalore in India, and the construction of new East-West and North-South transport corridors will require not only huge amounts of capital (Russian and foreign), but will also force the search for highly qualified specialists in these fields around the world. It will be difficult to find excellent specialists who possess modern innovative technologies and are willing to work in a country whose exchange rate has almost halved in five years from 56.32 rubles/USD on 01.02.2018 to 94.27 rubles/USD. 17.04.2024. Therefore, from an economic point of view, it would be justified to organize the issuance in our country not only of a new digital payment ruble, but also of an investment ruble backed by an asset capable of maintaining its intrinsic value and purchasing power.

Currently, the Russian ruble is not a reserve currency. This slows down the innovative development of the economy and forces the Central Bank of Russia to accumulate huge reserves in gold and foreign currencies, most of which are reserve currencies of unfriendly countries.

In the foreseeable future, there are no prospects for the ruble to become a reserve currency as it would require a global restructuring of the economy, entering a path of sustainable growth through innovation, expanding exports of high-tech products, attracting direct investment into fixed assets of foreign companies, creating international financial centers within the country, and significantly increasing the capitalization of the stock market and banking sector.

The creation of a digital currency by the Bank of Russia is a necessary and important step towards modernizing the country's monetary system. The economy needs a reliable and modern payment instrument that combines the best qualities of traditional money and cryptocurrencies. However, it is difficult to predict how much demand there will be for the digital ruble at this time. Based on foreign publications, it seems that there will likely not be explosive demand for digital rubles in the near future. The main drawback of the digital ruble is that it will not significantly contribute to economic growth in Russia.

Russia needs not a new form of payment ruble but a new investment vehicle. Currently, the Russian ruble does not fulfill its primary function as a means of saving, and the digital ruble would not provide this function either.

Therefore, economic agents in our country, due to the constant decline in the purchasing power of the ruble, do not seek to accumulate funds for their subsequent investment in the real sector of the economy, which is confirmed by the low share of gross investment in GDP: in Russia, this indicator is consistently equal to 20%, and in Mongolia and China — 40%.[9] The way out of this situation may be to link the exchange rate of the ruble (or, at the first step, part of the ruble money supply) to the value of an asset or basket of assets. If the Bank of Russia had ensured the stability of the purchasing power of digital rubles by, for example, freely exchanging them for a certain amount of gold, the investment process in our country would have started at a much faster pace.

In today's market, is gold still the best option for collateral to ensure the stability of the purchasing power of digital rubles? To

[9] The reference tables website. URL: https://infotables.ru/statistika/43-ekonomicheskaya-statistika-stran-mira/431-dolya-investitsij-ot-vvp-stran-mira-tablitsa (accessed on 11.04.2024).

Table 1

The Main Statistical Characteristics of the Dynamics of the Exchange Rates of the Ruble, US Dollar and Euro, as well as Gold

Indicator	Price			Profitability (monthly)		
	Mathematical expectation	Standard deviation	Coefficient of variation	Mathematical expectation	Standard deviation	Coefficient of variation
The cost of one troy ounce of gold in US dollars	1723.6	725.1	0.42	0.008934	0.045	5.03
The cost of one troy ounce of silver in US dollars	24.28	11.3	0.46	0.0122	0.0904	7.36
The cost of one troy ounce of palladium in US dollars	1157.9	604.5	0.52	–0.0108	0.087	–7.99
The cost of one troy ounce of platinum in US dollars	1184.7	328.75	0.27	0.0041	0.068	16.5
Ruble exchange rate against the dollar (USD/RUB)	59.88	21.1	0.35	0.0064	0.0567	8.8
The dollar exchange rate against the Swiss franc (USD/CHF)	0.935	0.061	0.066	–0.0011	0.026	–23.42
The euro exchange rate against the dollar (EUR/USD)	1.185	0.111	0.094	–0.008	0.0243	–30.38

Source: Compiled by the author.

answer this question, we need to analyze the recent market trends of gold, silver, platinum group metals and cryptocurrencies. We can also compare the profitability and risk of gold with that of global reserve currencies like the US dollar and euro, although these assets may be toxic for some developing countries.

To calculate the profitability and risk of the ruble, US dollar, and gold money supplies, monthly data from January 2010 to January 2026 were collected. Calculated mathematical expectations, standard deviations, and coefficients of variation for market prices and yields of these assets are presented in *Table 1*.

As can be seen in *Table 1*, gold has a relatively low coefficient of variation in market prices, indicating that the risk of investing in gold is low, despite significant fluctuations in its price. The average monthly yield of gold is 0.89%, or 11.2% per year, making it the second most profitable asset after silver. However, silver has a much lower cost, being 63 times cheaper than gold, which would require significant costs for storage and transportation. Platinum has a yield half that of gold's, while palladium has a negative yield. The ruble is losing value at an average rate of 0.6% per month against the dollar, and this figure does not take into account the fact that

Table 2

The Main Statistical Characteristics of Gold over the Period 1971–2025

Indicator	Price (in US dollars)			Profitability yearly (in shares)		
	Mathematical expectation	Standard deviation	Coefficient of variation	Mathematical expectation	Standard deviation	Coefficient of variation
Characteristics of the price and yield of one troy ounce of gold	780.9	817.5	1.04	0.1165	0.248	2.13

Source: Compiled by the author.

the value of the dollar itself is also decreasing relative to the Swiss franc and euro, as shown in *Table 1*.

It is noteworthy that gold has the lowest value of the yield coefficient of variation at 5.03 units. This value is four and a half times less than that of the US dollar (23.42), and 1.7 times less than that of the ruble exchange rate. Fluctuations in the value and profitability of gold in the modern economy can be explained by the fact that this asset is a safe haven for speculative capital during financial crises. When the global economy comes out of crisis, demand for gold decreases, and market prices for this metal fall.

Analyzing the data in *Table 1*, let us recall the words of L. Mises: "The value of gold is indeed changing, but the currency controlled by the state will be subject to even greater fluctuations" [30]. The validity of this statement by L. Mises was empirically confirmed by M. Friedman in 1986. He noted that inflation in Western countries has become higher and more volatile since 1971 [31, p. 645]. In the UK, the average annual inflation since 1971 has been 5.2%. The highest inflation rates were observed in August 1975 (26.9%) and in May 1980 (21.9%). During the era of the gold standard, global production of goods grew by 2.6% per year, and the global gold reserve increased by 2.5% per year. The result of the growth of gold, which corresponds to the growth of commodities in the long term, was almost zero long-term inflation and predictability of price levels in the medium and long term. The similarity in the growth rates of commodities and monetary gold over this long period was not an accidental stroke of luck, but a reliable result of an automatic adjustment in the supply of monetary gold, which brought its growth in line with the growth in demand for monetary gold, which corresponded to an increase in the real output of goods and services. This was an automatic result of market forces: the faster growth in real production after 1870 led to a faster growth in monetary gold reserves. Profit-seeking gold miners and refiners, along with mints, acted in concert on an almost unchanged long-term trend.

Let us take a look at the annual return on gold over a longer time period and see if its significance is not simply the result of increasing gold prices in 2025. *Table 2* shows the expected value, standard deviation, and coefficient of variation for the annual market prices and yields of gold during a period when there was no global gold standard, from 1971 to 2025, inclusive.

From *Table 2* it can be seen that the value of gold increases annually against the US dollar by almost 12% per year. The exception to this long-standing rule was the period from January 2024 to March 2026, when market prices for gold increased from $ 2.057.4 to $ 5.158.7 per ounce, i.e. 2.5 times. Consequently, over the past two years, the annual growth in gold prices has been 38% and 66%, respectively. This is due to a sharp increase in turbulence in global financial and commodity markets due to the unpredictable US foreign policy and the withdrawal of speculative

capital into safe assets. Such abnormally high growth rates of gold prices cannot last long. After the end of the Ukrainian and Iranian military conflicts, the global economy will begin to rise, and gold prices are likely to adjust.

In general, the study found that gold has higher annual returns over longer time periods than on short ones (see the data in *Tables 1* and *2*). Additionally, the risk of investing (coefficient of variation) in gold over longer time horizons is lower compared to shorter time horizons. Therefore, it is reasonable to conclude that gold is a long–term investment asset. Additionally, the daily profitability and risk of such potential collateral assets as bitcoin, ethereum and tezer were analyzed in the time interval from 07.01.2015 to 30.04.2024. All of the assets mentioned here had significantly worse investment characteristics than gold.

One of the most valuable monetary functions of gold is its ability to keep its exchange value constant. R.W. Jastram [32, p. 189] argues that the purchasing power of gold in the middle of the 20th century turned out to be exactly the same as in the middle of the 17th century, i.e. the purchasing power of gold has been constant for many centuries, despite fluctuations in its exchange value over short-term horizons. "Surprisingly, in the UK, the value of one acre of land today is equal to the value of as many ounces of gold as it was in 1700, while in the United States, the value of elite non-movable property, calculated in gold equivalent, remained at the level of the early 20th century" [33]. In addition, calculations have shown that the fair value of gold is four times higher than the current market value.

To further confirm the effectiveness of gold as a collateral asset, here are some statistics. As of 08.01.2024, when paper standards prevailed worldwide, the price of gold exceeded $ 2,028 per ounce. When President Richard Nixon "closed the gold window" on August 15, 1971, to end the remaining buyback of the U.S. dollar in gold, the official face value was $35 per ounce. The ratio of $2,028 to $35 means that the dollar price of gold has increased 58 times since August 1971. This increase far exceeds the increase in dollar prices for goods and services in general, while the GDP deflator index in the United States increased by less than 6 times during this time [34, p. 92]. Thus, the purchasing power of gold in relation to goods and services has increased significantly. This growth is mainly due not to an increase in gold mining costs or a drop in gold production, but to an increase in non-monetary demand for gold from people seeking to insure themselves against the uncertain future value of paper money.

For a more in-depth analysis of the mutual influence of gold prices and the US dollar exchange rate, a vector autoregressive model was constructed in which the monthly gold yield was used as a dependent variable, and lagged gold yields and lagged dollar-Swiss franc yields were selected as regressors. To improve the quality of this model, two more fictitious time variables were used as regressors: T — the ordinal number of the observation and t — the number of the observation day in the month, which were supposed to capture trend dynamics and seasonal fluctuations. All these initial time series were checked for stationarity using Dickey-Fuller statistics implemented in the Gretl program. All the series turned out to be stationary, since they are yields, i.e. the first differences from the original time series. The autoregressive model looks like this:

$$\underset{}{DZ_t} = \underset{(-2.5)}{-0.1279} * \underset{}{DZ_{t-1}} - \underset{(-7.9)}{0.5538} * \underset{}{K_t} + \underset{(2.2)}{3.11 * 10^{-5}} * \underset{}{T}, \quad (1)$$

where DZ is the yield of gold, K is the yield of the dollar against the Swiss franc, and T is a fictitious time variable (ordinal observation number). The Darbin-Watson statistic turned out to be equal to 1.9, i.e. the remainder of the equation satisfies the Gauss-Markov conditions. It can be seen from model (1) that the current yield of gold is influenced by the first lag of this variable, as well as the current values of the dollar exchange rate. But the coefficient of determination of this equation is 0.16, which indicates that there are other macroeconomic variables that also have a significant impact on the dynamics of gold yields. As the authors

of the article [35] have shown, gold prices are perfectly predicted using neural networks.

Thus, as statistical studies have shown, the value of gold has increased by 11.6% annually relative to the value of the US dollar since 1971. The purchasing power of the digital gold ruble will increase by the same percentage every year. Therefore, it will indeed be possible not to charge interest on digital gold rubles, which will be stored in accounts with the Bank of Russia. For loans that will be issued by a specialized division of this bank in digital rubles, or for investments that will be carried out in important government projects, it will be possible to charge a minimum interest rate, for example, 1% per annum.

Owners of digital gold rubles should have the right at any time to sell these assets at the current exchange rate and receive cash or non-cash rubles in return, should be able to exchange digital rubles for gold bars, or, conversely, should have the right to replenish their digital account by purchasing additional digital rubles for cash or non-cash rubles at the current exchange rate. Having accumulated digital gold rubles, investors will invest them in public-private infrastructure projects, in enterprises being created with state participation, in the construction of new factories, transport communications, buying targeted government bonds. Such investments should be long-term, for at least 10 years. Coupons for these bonds and repayment of the nominal value must be paid in digital gold rubles, which will be purchased by the Central Bank of the Russian Federation or another authorized government agency at the expense of profits from infrastructure projects. With the new form of the Russian ruble, it will be possible to pay salaries to key scientists and specialists in those sectors of the economy that the government recognizes as priorities for the economic development of our country. Thus, the emergence of a digital gold ruble, which perfectly retains its value over time, will solve the main problem for infrastructure design — access to long-term cheap borrowed funds.

The exchange rate of the digital gold ruble will differ from the exchange rate of the fiduciary ruble. The exchange rate of cash and non-cash rubles not backed by gold will be formed, as before, with the direct participation of the Bank of Russia, which pursues a pronounced mercantilist policy, helping Russian exporters to promote their products on world commodity markets [36]. The exchange rate of the digital gold ruble will be formed based on the daily changing values of world gold prices on the London spot cash metal market and converted into rubles at the official dollar exchange rate. USD to the Russian ruble, effective on the day following the day of setting the reference prices. One should not be afraid of having two ruble exchange rates, since such a practice already existed in the USSR, when a transferable ruble with its own special exchange rate was introduced to carry out foreign economic settlements with socialist countries.

Let us estimate how much gold the Central Bank of the Russian Federation will need at the initial stage of the implementation of the golden digital ruble project. For the first few years, the digital gold ruble will perform mainly payment functions and compete with cash rubles. Currently, the digital ruble is in the pilot testing stage, when payments in this new ruble form are made within a limited range of legal entities and individuals. The digital ruble will be available to all citizens and companies from September 1, 2026. In 2025, the increment of cash (aggregate M0) amounted to 960.2 billion rubles. Therefore, the increment of money M0 for four months (from September to December inclusive) will be approximately 320 billion rubles (960.2 * 4 / 12). Let us assume that the increase in the money supply in 2026 will be comparable to this volume. Let us also assume that half of the amount of this volume, i.e. 160 billion rubles, will be issued in digital rubles, and the rest in traditional paper form, since, judging by foreign scientific publications, cash is not going to give up its positions without a fight. Let us now calculate how much gold the Bank of Russia will need to reserve before September 1, 2026 for the issue of 160 billion digital rubles with 100% redundancy, if on 07.03.2026 the price of one troy ounce of gold was $5181.3, and the USD/RUB exchange rate was 79.26 rubles per dollar:

$$Vgold = \frac{160 * 10^9 * 31.1}{5181.3 * 79.26 * 1000 * 1000} = \\ = 12.11 \text{ tons of gold,} \quad (2)$$

this corresponds to less than 4% of the annual gold production in our country. The Central Bank of the Russian Federation can purchase this amount of gold from Russian gold mining companies, or it can reserve it in gold and foreign exchange reserves.

In the long term, if the digital gold ruble finds widespread use in non-cash payment transactions and in investment activities, much more gold will be needed for the reserve. Let us calculate the volume of gold collateral in the case of widespread use of the digital ruble in the economy, but for the current values of monetary aggregates. As already mentioned, according to Rosstat data, the share of Russian investments in fixed assets of GDP is 20%,[10] i.e. one fifth. Such a volume of investment has been steadily observed in our country since 2011. Therefore, Let us assume that in the future such an amount of investment in fixed assets will remain at the same level for some time.

If we recall I. Fischer's equation of exchange between the money and commodity masses, then approximately one fifth of the Russian M2 money supply serviced investment operations. The volume of the M2 money supply as of 01.02.2026 amounted to 127.8 trillion rubles,[11] a fifth of this amount will be equal to 25.56 trillion rubles. Of course, not all of this investment amount will be carried out in digital rubles. Let us assume the most optimistic scenario for the development of the digital ruble circulation process in our country, i.e. half of the investment will be carried out in digital rubles, and half in non–cash rubles. Then it will take 25.56 / 2 = 12.78 trillion rubles for investment purposes.

$$V\,gold = \frac{12.78 * 10^{12} * 31.1}{5181.3 * 79.26 * 1000 * 1000} = \\ = 967.8 \text{ tons of gold.} \quad (3)$$

At the beginning of 2026, there were about 2.330 tons of gold in the vaults of the Central Bank of the Russian Federation, which is 40% of the total value of the country's gold and foreign exchange reserves. If the demand for the digital gold ruble continues to grow steadily at home and abroad, then in 20 years the gold reserve can be increased by 6,000 tons (300 tons * 20 = 6,000 tons) through purchases of gold from domestic producers, thereby supporting Russian gold miners and prospectors, as well as related industries. The reserve gold stored in the vaults of the Central Bank of Russia will be protected from any unfriendly actions by Western countries. At the same time, to accelerate the accumulation of gold, it will be possible to sell some of the assets denominated in the portfolio of Russian gold and foreign exchange reserves in dollars and euros, and increase the share of gold in gold and foreign exchange reserves to 60–70%, as in developed countries. If the digital gold ruble begins to be widely used in international trade, the Central Bank of the Russian Federation will purchase gold on the world market at the expense of customers who want to purchase a new stable form of currency. Russia will also be able to settle import transactions in digital gold rubles, rather than dollars and euros, since foreign economic agents will be happy to accept a constantly rising in price, rather than a weakening currency.

The People's Bank of China has been pursuing a similar policy over the past few decades. He is rapidly increasing the state's gold reserves, the volume statistics of which have been closed since 2019. According to American experts.[12]

The total amount of gold in Chinese vaults already exceeds 30,000 tons, which is almost 4 times more than in the United States. This amount seems easily achievable, given that China has been a net importer of gold since the 1990s, despite accounting for 15% of global gold production, which remains entirely on the domestic market. It is not difficult to guess China's goals in accumulating gold in such volumes.

[10] Official statistics. Website of the Federal State Statistics Service. URL: https://rosstat.gov.ru/folder/11186 (accessed on 02.07.2024).

[11] URL: https://www.cbr.ru/statistics/macro_itm/dkfs/sr_ma_estim/ (accessed on 02.07.2024).

[12] Why doesn't China disclose all its gold reserves? URL: https://www.11onze.cat/en/magazine/why-doesnt-china-disclose-all-its-gold-reserves/ (accessed on 02.07.2024).

Thus, if the project called the "Golden Digital Ruble" proves successful and in demand in the global financial market, then gradually the Central Bank of the Russian Federation will be able to get rid of assets in Russian gold and foreign exchange reserves denominated in unfriendly currencies, replacing them with the Russian golden digital ruble, as trade in Russia and with developed countries may switch to the digital ruble. if its monetary properties turn out to be better than those of the dollar. As the conducted research has shown, the market value of gold in the medium and long term will have a predominant upward trend.

CONCLUSIONS

The introduction of the digital ruble is likely to have a significant impact on creating a more advanced payment system. It will also increase the credibility of the central bank and reduce the risk of money laundering. However, it will not affect the rate of economic growth in Russia. The digital ruble is just a new way of making payments, similar to the non-cash ruble. It does not fulfill two important functions: it is not a means of savings and it is not world money.

To address these shortcomings and improve the investment climate, it is suggested that gold be used as collateral for the digital ruble. Research has shown that gold is one of the best collateral assets available.

Since the digital gold ruble will maintain its purchasing power over time, loans in this new form of Russian currency can be issued at a very low interest rate, without considering the projected inflation rate. It is possible that rates on such loans could even be lower than 2% per year, which would activate the main interest rate transmission channel of monetary policy and accelerate innovation-driven economic growth. As a result, the Bank of Russia would be able to implement a monetary policy that stimulates both the production and export of goods, while reducing the value of the fiat ruble. Additionally, this would stimulate the production of high-tech products, while maintaining the value of the digital ruble. Targeting inflation with a simultaneous increase in the key rate and a reduction in lending volumes should not lead to an increase in interest rates on transactions involving digital rubles and should reduce the demand for investments in high-tech industries.

Currently, some developing countries lack sufficient funds for integrated development, such as the construction of modern transport corridors connecting north-to-south Eurasia and east-to-west across the continent. The construction of these transport corridors would shorten cargo delivery times, lower transportation costs, create new jobs, and consequently boost GDP growth and improve the well-being of residents in vast territories.

The creation of a digital ruble backed by gold could be seen as the emergence of a new reserve currency and a powerful source of funding for infrastructure projects, not only in Russia but also across Eurasia.

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