The Role of Gold in the Digital Age*

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This article follows the change and evolution of the role of gold in the modern economy. It points out the current resurgence of its reserve asset function and the reasons for this, including, in particular, the centuries-old trust in it and its credit-risk-free nature at a time when the FinTech revolution is challenging both the legitimacy of the forms of money we know at present, and the role of the state.

1. Introduction

One of the most important megatrends of our time is technological development, digitalisation. Given the disruptive nature of these changes, it is no exaggeration to say that we are entering a new age, the "digital age", where it is not simply a matter of taking more and more advantage of technology, but of our everyday lives being so pervaded by digital tools that almost all of our lives are being transformed.

The shift from the physical to the virtual particularly affects finance, as this is the sector where the technological leap has been one of the fastest and most radical. While progress is happening at a dizzying speed — we can transfer money from one account to another in seconds, business solutions based on blockchain technology, incomprehensible to many, are becoming more widespread, and we can trade with people tens of thousands of kilometres away from us by using our mobile phones — we are still left with an oddball. A financial instrument that with its past and physical characteristics is almost the incarnate denial of the digital age, yet "its star does not fade", it does not lose its appeal and it has not dwindled into oblivion. In fact, it is becoming increasingly popular. This is none other, than gold.

2. The evolving role of gold

Gold owes its historic role to the properties that enabled it to perform money functions extremely well. Initially, as a commodity currency, gold fulfilled the functions of a means of exchange, means of payment, an accumulation instrument and a benchmark of value. It was recognised as money by economic agents because of its durability, its divisibility and the confidence it created in the monetary system due to its limited quantity.

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Gold first served a monetary policy function in the modern sense in the classical gold standard system between 1880 and 1914. During this period, some countries committed to converting their national currencies into gold at a fixed rate. It was essential for the central banks to provide the gold backing needed to maintain the system. The First World War also drastically undermined the existing financial system, and by the end of the war the gold reserves of European countries had been greatly depleted, with a significant proportion going to the United States.

Gold continued to play an important role in the Bretton Woods system established in 1944: the participating countries held their reserves primarily in US dollars, and the United States guaranteed the conversion of dollars into gold at a fixed rate. From the late 1960s onwards, however, tensions increasingly grew with divergent economic developments, the resulting upwards and downwards pressure on exchange rates as well as the imbalances of the balances of payments leading to the collapse of the system in the early 1970s.

With the break-up of the Bretton Woods system in 1971, so-called fiat currencies were introduced. In the fiat system, the stability of the money is no longer ensured by its physical convertibility into a precious metal, but by the legal requirement to accept it, or by the strength of the real economy of the issuing country.

Despite the change in gold's monetary policy function, it is still a priority for central banks, which currently hold 35,395 tonnes of gold accounting for almost 14 per cent of global central bank reserves. The 10 countries with the largest gold reserves hold 67 per cent of the total gold reserves of central banks, i.e. there is a high concentration of gold reserves (*Table 1*).

Table 1
Top ten countries with the largest gold reserves (June 2021)

	Country	Quantity of gold reserves (tonnes)	Proportion in reserve (per cent)
1.	USA	8,134	78
2.	Germany	3,361	75
3.	Italy	2,452	70
4.	France	2,436	65
5.	Russian Federation	2,292	22
6.	China	1,948	3
7.	Switzerland	1,040	6
8.	Japan	846	4
9.	India	695	7
10.	Netherlands	613	68

Source: World Gold Council

In recent times, as a result of changing central bank, economic and geopolitical developments, the perception of gold reserves and the role of gold as a credit-risk-free asset with no dependence on any issuer have increased. As a consequence of these developments, many central banks, chiefly in developing countries, have increased their gold reserves. Russia and China have increased their gold reserves dramatically: the Russian central bank has increased its gold reserves from 500 tonnes to 2,292 tonnes since the outbreak of the global economic crisis in 2008, while the Chinese central bank has increased its gold reserves from 600 tonnes to 1,948 tonnes over the same period. Gold also plays an important role in the international reserves of the Magyar Nemzeti Bank (the Central Bank of Hungary, MNB): the MNB decided to increase Hungary's gold reserves in 2018 and 2020 based on long-term national and economic strategy considerations, and the gold reserve increased from 3.1 tonnes to 31.5 tonnes and then to 94.5 tonnes. This moved Hungary from the middle to the top third of the international ranking.

3. Evolution of the financial system

In uncertain historical times, gold has always been in the spotlight, but the question is what the beginning of the 21st century is like in this respect, and what it means from the aspect of gold.

Few now doubt that the digital age will bring about a transformation of society, and in particular the economy and the financial system as a whole, and even money itself will be transformed. Money is in many ways a constant, yet it has evolved considerably over the last centuries. The social functions fulfilled by money have been relatively stable, but the world has progressed from ancient coins, through Chinese paper money in the 9th century, Arab cheques (Sakks) and medieval northern Italian banking, to modern money. In the current financial system, the bulk of the money in circulation is not created by central banks but by commercial banks in the lending process. Digital development has also brought about a significant change in this respect, as the FinTech revolution is challenging both the legitimacy of the previously known forms of money and the role of the state.

What are the dangers of the digitalisation of money? The most striking implication is that the role of cash in transactions has declined significantly in many developed countries over the past decade (in Sweden, only about a tenth of the population currently say they are cash users), and looking ahead, the trend is likely to continue as the appeal of cash for the new generation of digital-age citizens may continue to decline. At first glance, the decline of cash may seem to be a "formality", but in

fact it affects the very foundations of the financial system: the existence of cash is a fundamental condition for the safe functioning of the two-tier banking system, since scriptural money is in fact a private banking obligation on cash, the means of payment guaranteed by the state. In addition to prudent lending by banks and deposit insurance guarantees, the safety of account money is based on trust in cash.

We have arrived at the basis of any well-functioning financial system, which is broad social trust — confidence that money will be widely accepted, that payment transactions can be carried out, that the financial system will ensure financial and price stability, and that the value of money will be stable. It is no exaggeration to say that the simplest and most complicated question in finance is what money is. There are many possible answers to this question, but what all definitions have in common is that without social trust, there is no money — that is, while digitalisation has brought significant changes to the financial system, without trust, the money of the digital age cannot work either. Digital currencies include a wide range of substantially different currencies: commercial bank deposits, central bank deposits, virtual currencies as well as cryptocurrencies brought to life by the digital revolution which face perhaps the biggest challenge in terms of trust, as they proclaim that institutional trust can be replaced by trust in a decentralised system and a technological solution.

Trust can also be a key concept in the relationship between gold and the digital age. Throughout history, it has also typically been the backing behind money — the means of "escape" in the event money becomes useless — that has strengthened social confidence in money, and gold, which is valuable and very scarce, played this role for a long time. It was an important milestone in the evolution of money, when money broke away from gold (this was the "demonetisation of gold"), and now the question is what can become the "collateral" of the digital age, assuming that the backed nature of money is preserved. There are several possibilities, but if we accept that data and energy are the key resources of the digital economy, it follows that the range of possible collateral can certainly be extended to include these two factors.

However, besides the appreciation of other factors and collaterals, the overall confidence in gold remains high due to its historical and cultural role, making gold a very tangible point of reference even in the digital age of virtuality. Digitalisation brings a new world in technical terms, but it does not affect the characteristics that give gold its value, the most important of which, trust, is linked to the human mind, faith, psyche, the "collective memory" of humanity.

4. Gold in the digital age

Can the digital age end the special role of gold; will the "golden age" draw to a close? The relevance of this question is well illustrated by Fed Chair *Jerome Powell*'s statement earlier this year that "bitcoin could be a substitute for gold rather than for the dollar". If this is the case, then gold may indeed be relegated to the background, especially since bitcoin, often proclaimed "digital gold", is only one of the representatives of the cryptocurrency family, as other coins with smaller and larger capitalisation have also appeared in the financial world in droves over the past few years. Therefore it's worth taking a look at how gold compares to its digital rivals.

A key question is whether these two types of assets really mean the same thing to users. What are the features that link these assets and what are the factors that separate them? If cryptoassets were to be described in one word, perhaps the best word would be "freedom". They are not regulated. They have not been created by a government of a country or a multilateral organisation. It is easy and fast to trade with them across borders. Of course, these are somewhat overshadowed by the fact that there is no supervisory or consumer protection authority to protect against abuse. And the asset class itself is incredibly speculative; you can suddenly get rich with these assets in their current form, or just as suddenly lose everything. In addition to freedom, this dream-like potential success may be attractive to investors, while several factors hamper the development of social trust: the effectiveness of cryptotechnology is questionable, abuses are substantial and frequent, the role of the black market is significant, and there is no actor with a vested interest in stability. Gold, on the other hand, is more associated with trust and stability of value — and for good reason.

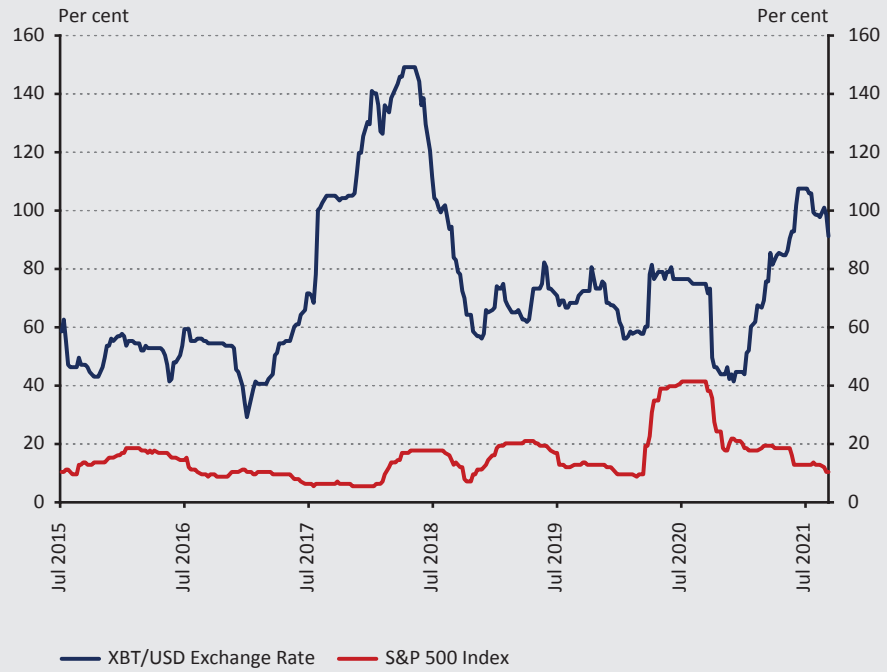
It is perhaps already apparent from the above that the potential target audiences for the two instruments, although similar in many of their needs, are different overall. Similarly to cryptoassets, gold is also out of control of countries, authorities and governments, but its acceptance at the state level is significant. Just think of it as one of the most important reserve assets for central banks. Although there are many regulated markets, gold can also be obtained anonymously in various forms. In this sense, it offers similar freedom to cryptoassets, although overall trading is significantly more cumbersome and expensive than in the case of its digital competitor.

It is also worth considering how gold and bitcoin react to business cycles. If we try to place cryptocurrencies in the traditional investment valuation framework, the value of a crypto-network (and thus a cryptocurrency) is determined by the number of transactions and the number of expected future transactions. It is easy to see that the higher the number of transactions and expected transactions, the more valuable the given network. The number of financial transactions is positively correlated with the business cycle, and therefore cryptocurrencies can be considered as pro-cyclical ("risk-on") assets, as opposed to the defensive ("safe haven") gold, so by this logic the two assets react differently to changes in business cycles and risk appetite. However, what the two instruments may have in common is that neither of them is issued by a specific entity, so there is no need to be afraid of credit risk.

As discussed above, gold has served as a means of payment for thousands of years and is therefore deeply embedded in the human psyche, and its function as a store of value is also largely due to its prominent role in the collective consciousness. By contrast, in just over a decade bitcoin has proven to have a very limited capacity to perform payment functions (bitcoin can process 7 transactions per second, while Visa has a maximum capacity of 65,000 transactions per second). The question is whether such a short time and relatively limited diffusion have been enough for the majority of society to endow bitcoin with a feature as a store of value similar to gold? Over time, decentralised, anonymous market operation can become a barrier to the development of full social trust. From time to time, the bitcoin market has been subject to serious allegations of market manipulation. There are no such problems with the gold market, so from this point of view it can be considered a more stable, safe and regulated market. This raises further questions about bitcoin's gold ambitions, as how can an asset act as a store of value if its exchange rate is subject to heavy manipulative attacks?

The short but volatile history of bitcoin makes it difficult to integrate into traditional portfolio allocation decisions (see *Figure 1*). Professional institutional investors take a number of quantitative factors into account when constructing their portfolios. The market capitalisation and liquidity of bitcoin is not sufficient for most institutional investors, which could significantly hinder its propagation. Beyond, but still related to, the liquidity constraints, bitcoin's volatility is extremely high (bitcoin's average annual volatility since its launch in 2010 has been about ten times that of gold), which most institutions with strict investment policies cannot tolerate.

Figure 1
Volatility of bitcoin and the S&P 500 stock market index



Source: Bloomberg, MNB calculation (annualised standard deviation of weekly returns over a six-month moving window)

The high volatility is also partly due to the unclear position of regulators. In the US, the cryptocurrency family has come under the spotlight primarily due to concerns about money laundering, terrorist financing and tax evasion. The growing concern of the US government and regulators is driven by the hacking attack on the Colonial Pipeline and the extortion case in bitcoin. The story of the fuel company is not unique, as cybercriminals are known to have a predilection for demanding ransom in bitcoin in software extortions. This phenomenon has led to some companies setting aside funds in bitcoin to pay potential future ransoms in preparation for cyber attacks.

In addition to the United States, China and Europe are becoming increasingly active regulators regarding cryptocurrencies. In China, bitcoin has been targeted mainly because of capital restrictions and increased state control, and the digital currency project of the People's Bank of China (PBoC) has also created a strong conflict of interest. As a result, the PBoC called upon Chinese state banks to block transactions in cryptocurrencies. In Europe, the European Central Bank (ECB) compared the

development of bitcoin's exchange rate to previous financial bubbles in its latest Financial Stability Report, calling the cryptocurrency itself risky and speculative. Beyond financial stability concerns, the ECB has also drawn attention to the huge carbon footprint of bitcoin mining and potential illegal use of the cryptocurrency.

5. Conclusion

The digital age is upon us, especially in finance, but gold is "hanging in". After all, the financial system is based on trust, and gold remains synonymous with security despite all the technological advances. While its price may be volatile, millennia of experience tell us that whatever extreme event we face, gold will have value. Understandably, the decade-long history of cryptocurrencies, considered by many to be the main challenger to gold, does not allow for this kind of confidence, and, what's more, there are growing signs that they will be synonymous with risk for some time to come.

The fact that central banks continue to believe in gold, mainly because of its long-term positive properties, is an indication of its continued importance. Gold is one of the most important reserve assets as a line of defence against severe crises, acting as a fallback asset in times of heightened risk aversion and crisis situations, increasing a country's resilience to market turbulence. By holding a physical gold reserve, the central bank does not face credit risk even in a crisis; it has a diversifying role and helps to reduce the concentration of the reserve by spreading the financial risk thereof. Due to the aforementioned legacy of confidence, by holding physical gold the central bank is able to boost confidence in the country both domestically and abroad, especially as the role of gold as a store of value could increase if fears of a sustained rise in global inflation intensify.

The lessons of economic history so far suggest that gold may also play an important role in the revolutionary transformation of money, and the ongoing evolution of the financial system is likely to increase the importance of gold in central bank reserve management. The added value of thousands of years of tradition and crisis resilience has been proven many times in history for gold, which can remain highly relevant as a modern investment instrument, especially in times of inflation.

Even though it is one of the most traditional tools, gold is not immune to progress. Over the past decades, many developments have been made to address the biggest problem with gold: its availability. For a relatively long time, ETFs and certificates have allowed even small investors to benefit from the advantages and returns offered by gold. And digital technology has brought new advances in this. There are also cryptocurrencies on the market that are backed by 100 per cent gold, allowing

quick access for anyone even in small amounts. The new technologies have thus provided gold with another opportunity to strengthen its prominent role even more widely, rather than ending the “golden age”.

All the evidence suggests that gold is not lost in the digital age. At most, it will be transformed.