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FEATURES OF THE IMPLEMENTATION OF DIGITAL CURRENCY VALUES: FUNDAMENTAL PROBLEMS AND PROSPECTS FOR IMPROVEMENT

Abstract. The authors formulated the main pros and cons that encourage central banks to issue digital currency values, as a result of which certain fundamental problems that such a currency can cause in monetary policy are substantiated, and reforms that may be relevant in the future are proposed. Although far off, it may not be far-fetched to think of a future where, as in ancient Athens, money is produced privately, serving the "common" good reflected in democracy, free markets, and individual liberties by limiting the state's power over money by protecting competition and stopping illegal activities and tax evasion. However, until then, faced with the challenges of cryptocurrency, governments are likely to implement hybrid systems consisting of two nodes: one that involves a public digital mint that supplies electronic money on a voluntary basis, and another that is rich in cryptocurrencies that circulate in parallel and under conditions of competition. In such a setup, the government declares that all its transactions with the public will be settled and settled in its own electronic money, bitcoins and their denominated banknotes. As a result, government electronic money and bitcoin will become

reserve currency values. Demand for them will increase, incentives for financial institutions to issue banknotes denominated in them without state-imposed convertibility obligations. And just as importantly, until the government issues a mandatory electronic currency, as such an initiative would seriously undermine democracy and citizens' sovereignty, it will issue a voluntary one on terms that preserve its value.

Keywords: digital currency values, National Bank, cryptocurrency, digital payments, monetary policy, banking system, financial stability, bitcoin.

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ОСОБЛИВОСТІ ВПРОВАДЖЕННЯ ЦИФРОВИХ ВАЛЮТНИХ ЦІННОСТЕЙ: ФУНДАМЕНТАЛЬНІ ПРОБЛЕМИ ТА ПЕРСПЕКТИВИ УДОСКОНАЛЕННЯ

Анотація. Авторами сформульовані основні плюси та мінуси, які спонукають центральні банки до випуску цифрових валютних цінностей, в результаті чого обґрунтовано певні фундаментальні проблеми, які така валюта може викликати у монетарній політиці, і запропоновано реформи, які можуть бути доречними в майбутньому. Хоча далеко, це може не бути було б надуманим думати про майбутнє, де, як у стародавніх Афінах, гроші вироблятимуться приватно, що слугуватиме «загальному» благу, яке відображається в демократії, вільних ринках і індивідуальних свободах шляхом обмеження повноважень держави у сфері грошей захистом

конкуренції та припинення незаконної діяльності та ухилення від сплати податків. Однак до тих пір зіткнувся з викликами щодо криптовалюти, уряди, швидше за все, запровадять гібридні системи, що складаються з двох вузлів: які передбачатимуть державний цифровий монетний двір, що постачає електронні гроші на добровільній основі, а також інший багатий на криптовалюти, які циркулюють паралельно та в умовах конкуренції. У такій установці уряд оголошує, що всі його операції з громадськістю будуть розраховані та розраховані в його власні електронні гроші, біткоіни та деноміновані ними банкноти. У результаті державні електронні гроші та біткоін перетворюються на резервні валютні цінності. Попит на них зросте, стимули для фінансових установ випускати деноміновані в них банкноти без накладених державою зобов'язань конвертованості. І не менш важливо, поки уряд не випускатиме обов'язкову електронну валюту, оскільки така ініціатива серйозно підірве демократію та громадян суверенітету, він видасть добровільну на умовах, які збережуть його цінність.

Ключові слова: цифрові валютні цінності, Національний банк, криптовалюта, цифрові платежі, монетарна політика, банківська система, фінансова стабільність, біткоін.

Analysis of recent research and publications. The study of this problem in Ukraine remains unstudied, which is why a problem arose in its analysis. In part, this problem was raised by such scientists as Andrushchenko I.G., Bukhtiyarova I.G., Hetmantsev D.O., Mysiat N.O., Starynskyi M.V., Sinyanska A.O.D., Strelchenko O.G., Shuklina N. G., etc.

Formulation of the problem. Over the past 30 years, digital technologies such as the Internet, artificial intelligence, machine learning, robotics, virtual and augmented reality have fundamentally changed our daily lives. This technological revolution began with replacing physical mail with electronic mail, moved to phone calls and texts, online shopping, efficient Internet searches with the excellent Google search engine, the use of electronic forms and books, and during the pandemic, most work was done at home. began to perform at home. While digital technology was developing rapidly, many economies, including the US, experienced the global financial crisis, which was followed by an unusually slow recovery and three more years of the pandemic. During the pandemic, digital technologies such as Zoom and Teams facilitated online education, teleconferencing and remote working, which reduced the spread of Covid-19 and furthered the growth of the digital economy. These changes were accompanied by no less fundamental structural shifts in the production and distribution of goods and services, in labor and commodity markets, in the domestic and international financial sector, and in institutions responsible for relevant legislation and regulation. Thus, today we are witnessing how individuals, families, schools and churches, universities, businesses, local and national

governments are feeling the effects of these changes, as well as central banks, which are variously interested in studying the impact digital technologies in the monetary sphere and conducting monetary policy. In this context, the aim of this work is to identify the set of forces that are driving these changes, to discuss some fundamental issues concerning the so-called central bank digital currency (CDC) and the monetary system, as well as proposals for reforms that may be appropriate in the future. The currencies in question raise a number of questions. For example, they range from technical and economic issues to political, ethical and even constitutional issues.

The purpose of the article is a thorough characterization of digital currency values and the identification of their fundamental problems and the identification of prospects for their implementation

Presenting main material. In order to characterize digital currency values, it is important to understand the roots of two important developments: the first concerns the process by which digital information and communication technologies (ICTs) enabled the transition from the old distributed ledger technology (DLT) to the modern blockchain technology (BC). In traditional DLT, or simply DLT, the clearing of transactions between network participants, such as a company operating in many geographic regions, is handled by a central office administrator who performs all tasks necessary to maintain integrity between the master copy of the ledger and the three distributed ledgers. It was done. In contrast, in the state-of-the-art DLT regime presented by the BC, there is no administrator or ledger, and copies held by network participants are automatically updated and verified in real time. The subtle difference is that in the first case, coordination is achieved with the help of commands from the administrator to subordinate network participants, while in the second case, coordination occurs through the process of interaction between independent network participants, as in a perfectly competitive market. What could be more meaningful than that? Likewise, a digital currency controlled by a central bank would function much like current paper currency, where trust is based on the central bank's obligation to protect the currency's purchasing power and act as a lender of last resort. On the other hand, a digital currency such as Bitcoin will function as a decentralized market exchange system where trust arises from immutability of records and unconditional openness to the public [1].

The second important change is related to the significant opportunities that digital technologies have brought to the production and circulation of private currency. In the past, as documented by Brunnermeier et al. (2019) and many others, with few exceptions, unbacked private notes failed because they lacked the advantages of official currency. However, over the past 15 years, the expansion of e-commerce in the country and abroad has led to a significant increase in the demand for electronic payments on the one hand, and a significant decrease in the use of cash on the other. Moreover, these two trends have spurred technology startups

("fintech") and large social media e-commerce platforms ("big tech") to accelerate their entry into financial markets traditionally dominated by banks and credit card companies. Given that central banks directly or indirectly dominate private currency issuers, and given the undeniable possibility that the growing appeal of cryptocurrencies could further erode their position, it is not surprising that central banks are showing significant interest in cryptocurrencies. The first concerns the potential impact of these developments on their ability to effectively implement monetary policy and conduct microprudential operations, and the second concerns the benefits that central bank digital currencies (CBDCs) can offer to preserve and further strengthen central bank positions in the monetary system. Chapter 2 focuses on the reasons why central banks might want to issue their own digital currency: the growing body of literature on CBDC economics shows that there is a wide range of motivations for central banks to issue digital currencies, other than avoiding competition with private currencies. For example, the adoption of the idea of "central bank electronic money for all", promoted by Berentsen, Schär (2018), can contribute to strengthening the independence of the central bank and tighter management of the money supply [2].

On the other hand, if it is confirmed by research, there is a potential significantly positive net balance of potential benefits and potential risks. In Section 3, we comment on some of the political-economic issues that may stand in the way of CBDC implementation. To anticipate our approach, we assume that CBDCs do increase central bank independence. In light of the existing literature, this would certainly be welcomed. However, the CBDC will give the government enormous influence over the private lives of citizens, which raises the question of whether this progress will be beneficial for citizens or not. Chapter 4 focuses on how the monetary system will develop in the future. In light of the findings of Friedman and Schwartz (1986) at the dawn of the digital revolution, it is certainly a bold move to assume that current democratic governments will stand aside and lose their exclusive power over unbacked paper money [3]. However, digital technologies seem to be closely related to the maintenance of civil sovereignty, and this time the production of regional and international private money may prove extremely difficult for authorities to control. Finally, the research results are summarized and conclusions are drawn [4].

The monetary and credit system of Western-type countries is based on the state currency, which functions on the basis of a partial reserve system. This means that the central bank advances a small amount of so-called "base" money, expressed in currency units, to the corresponding private commercial banks, which in turn create large amounts of money in the same currency by lending to economic agents within certain limits set by the central bank to ensure currency reliability. This is a two-level system. As a result, in such a two-tier monetary system, although the vast majority of money in circulation is created by commercial banks, the money is not

private. This is because the currency used in the form of cash is a very small share of the total money supply, and this share is constantly decreasing. Therefore, if the interest in CDDC from central banks in the literature is strong, it is not clear why central banks want to replace today's established and widely digitized sovereign currencies with their own digital currencies. There is currently no conclusive evidence on the net balance of potential benefits and risks, so they may lag. We believe that central banks have strong economic incentives to issue such currencies, but political economic considerations may also delay their issuance. The task of this section is to explain the factors that can encourage central banks to introduce this reform [5].

Bitros (2015), based on accumulated data on the causes of the financial crisis that erupted in the United States in 2008 and quickly spread around the world, argues that this crisis was caused by the Federal Open Market Operations Committee ("Fed" or "central bank of the United States ") and federal fiscal authorities ("the US government" or simply "state") concluded that it was caused by errors of omission and excess of authority committed during the previous years. The key of these mistakes was the Fed's inability to limit the risky activities of commercial banks [6]. This inability was not the result of guesswork; it was not the result of a one-time error in the Fed's microprudential regulatory policy. The main reason was the moral hazard that the Fed's status as a lender of last resort introduced into the decision-making process of commercial banks. It is true that the Fed, in cooperation with the fiscal authorities, left the collapse of the big bank Lehman Brothers to warn against the risky behavior of the latter. However, the caveat was soon lost as the Fed recognized that the banking sector was dominated by "too big to fail" banks. This is because, as long as systemic banking management seeks to maximize profits for itself and its shareholders, it will always find a way to violate the limits set by the law. Consequently, because of the moral hazard problems inherent in the established two-tier banking system, and because a small number of commercial banks have allowed the risk of their bankruptcy to become so great as to be incompatible with maintaining the monetary system, we can expect an increase in the frequency and severity of financial crises. The Fed has a number of options for responding to this frightening prospect. There are a number of reform options to address this.

A moderate option is to leave the structure of the banking system as it is and introduce CBDC accounts for settlements only for all citizens, as recommended in the literature [see e.g. Carstens (2021), Panetta (2022)] Berentsen, Schär (2018) [7] analyze its characteristics in detail and come to the conclusion that the net gain in the stability of the banking system, the effectiveness of monetary policy, operational simplification and other important parameters is significant. Another, more radical reform would be to push the Fed to adopt some form of the so-called "Chicago Plan" or "100 percent reserve" proposal. At the same time, given the fact that commercial banks may lose income and other benefits associated with the current regime of

partial reservation, reforms in the above-mentioned direction will encounter strong resistance from their side. In short, while the lessons and experiences of the 2008 financial crisis may stimulate the Fed's interest in CBDCs, their implementation will rather depend on the formation of a favorable political consensus. Is such a reform possible in today's divided political system, where the big banks are likely to oppose it given that it can be implemented? We will leave this sensitive issue for the next section. Government-issued banknotes, whether secured or not, convertible into precious metals or not, serve three functions. They are a unit of account, a means of payment in transactions and a means of storing value. Before the advent of digital currencies, the Fed had a strict monopoly on all three attributes and services of the US dollar. Since then, a number of private digital currencies have entered the market, which, at least for the time being, provide these services more or less satisfactorily. As a result, this trend has given rise to a growing body of literature arguing that it undermines the Fed's monopoly power, independence, and even "sovereignty" and undermines the Fed's ability to conduct monetary policy effectively [8].

Since then, the number of cryptocurrencies is in the thousands, and the number of cryptocurrencies continues to grow, with the number of cryptocurrencies increasing by more than a third in the past few years. However, these currencies will not challenge the dominance of public funds for the foreseeable future - a prospect that emerged when the giant Facebook announced plans to introduce a digital currency called Libra in 2019. According to the provisions outlined in the first white paper, this currency is designed to: - be a simple global currency and financial infrastructure that empowers billions of people; be based on a secure, scalable and reliable blockchain; create internal value to be backed by a reserve of assets; and managed by the independent Libra Association, whose mandate is to develop the ecosystem. Not surprisingly, the project has been embroiled in byzantine debates in the US Congress and is still pending. Even more amazing is the fact that the project is still pending in the US Congress. A year later, Facebook tried to launch the same currency in Switzerland called Deem. However, again to no avail, and their petition remains pending before the relevant Swiss authorities. Contrary to their earlier heroic assumptions, given the reaction of governments to Facebook's rapid entry into the cryptocurrency market, they will strongly object to any attempt to undermine the current monopoly power of central banks over national currencies. However, there are currently a number of giant companies in the world with large ecosystems capable of growing their own currencies, and they are quickly learning from their mistakes. If Facebook's ambitions were limited to introducing Libra and Diem as payment tools rather than full-fledged cryptocurrencies, it would be very difficult for the US and Swiss governments to refrain from granting the necessary permissions. In fact, as analyzed in detail by Brunnermeier et al., Libra and Diem were introduced only as payment instruments, not as cryptocurrencies. (2019), there are signs that "big tech" companies are gradually starting to not only "merge" the

three traditional functions of currencies, but also "reemerge" them by adding more services, thus seriously undermining the exclusive power of central banks over national currencies. Given these trends, the Fed will likely be forced to issue its own digital currency. Firstly, as a means of protection against potential competition from private digital currencies that may appear as part of the Libra project, and secondly, to preserve the Fed's monopoly on monetary policy [9].

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