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Chapter 5: The Digital Euro: Challenges and Opportunities

Like other central banks, the European Central Bank (ECB) has been working on introducing a digital currency. While a decision has not yet been made, a report has been presented for consultation on the various problems and issues that need to be addressed before launch.¹ The European Commission has also presented new draft regulations in the areas of digital finance and payments. All these moves are intended to facilitate digital innovation in Europe, and to improve the quality and costs of payment services. At the same time, there is a clear need to preserve the monetary integrity of the eurozone at a time when digital payment systems being launched by foreign central banks and big technology firms could seize a significant share of the domestic market.

The development of the new currency is of particular strategic importance to the ECB, as it will further the process of integrating the eurozone payment system, which has already led to the introduction of TARGET 2 (T2) and TARGET 2 Securities (T2S) for the settlement of interbank payments and security transactions. It could also reinforce its role as a catalyst of EU market integration. The implementation of a digital currency, however, would face several challenges, given the highly innovative nature of the instrument and the fragmentation of the payment systems and capital markets in Europe.

This chapter will first discuss the implications of the digital transformation of payment systems for central banking. It will then briefly analyse how the payment system landscape in Europe is evolving. After that it will describe the main features of the digital currency proposed by the ECB and the place it would occupy in that landscape. Next, it will present the main problems and risks associated with the introduction of a digital euro, given the unique features of the European financial system, and will lay out measures and policies that could mitigate these risks.²

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- 1 European Central Bank (ECB), *Report on a Digital Euro*, Frankfurt am Main, ECB, October 2020, <https://www.ecb.europa.eu/euro/html/digitaleuro-report.en.html>.
 - 2 The author thanks Angela Caporini, Claudio Impenna and Maria Iride Vangelisti for their comments. The usual disclaimer applies.

5.1 Digital currencies and central banking

The evolution of payment systems has been one of the main drivers of the evolution of central banking.³ Technological innovations in the payment system and the growing familiarity of the public with digital instruments have not only changed the way central banks operate but have also affected some of their core functions and institutional features.

The first important change is the role central banks play as providers of cash, the most widely used medium of exchange by the public.⁴ It is a particularly popular instrument because it guarantees anonymity and has the status of legal tender, so it cannot be refused when presented to discharge a monetary obligation.⁵ Banknotes also ensure instant payment, unlike cheques or money orders and their value is risk free because they are a liability of safe institutions, central banks.⁶ Their purchasing power is in principle preserved even if used as a store of value because central banks have a special mandate to prevent the value of money being eroded by inflation.⁷ The status of banknotes as a risk-free, widely

3 Curzio Giannini, *The Age of Central Banks*, Cheltenham/Northampton, Edward Elgar, 2011.

4 A payment medium is a financial asset used to discharge obligations in transactions between two parties. A payment instrument is a device or procedure used to mobilise the payment medium. Cash refers both to coins and banknotes. In some countries, banknotes are issued by central banks while coins are minted by the state or government agencies. Banknotes are both a payment medium and a payment instrument, while in the case of bank money bank deposits are the medium and checks, demand drafts and the like are the instruments.

5 The concept of legal tender is not applied uniformly across European countries. The most common interpretation is that it cannot be refused as a means to execute a payment. In countries such as Germany, Finland, the Netherlands and Ireland, 'the legal tender provisions refer to the fulfillment of an essential part of a contract already concluded and do not amount to an obligation to conclude a contract allowing for cash payments.' See Euro Legal Tender Expert Group (ELTEG), *Definition, Scope and Effects of Legal Tender of Euro Banknotes and Coins*, Brussels, 2010, p. 6, http://ec.europa.eu/economy_finance/articles/euro/documents/elteg_en.pdf.

6 With banking instruments, there is a lag between the time the payment is made and the time the money is actually transferred to the receiver's account. The longer the interval between the payment and settlement, the greater the likelihood that some payments will not be successfully completed, whether because of technical problems, liquidity issues, insufficient funds of the counterpart (the so-called counterparty risk) or, in extreme cases, the sudden, unexpected failure of a participant. This creates credit risk, liquidity risk and systemic risk.

7 It also embeds technical features which limit the risks of counterfeiting.

accepted payment medium has historically given central banks a monopoly in the retail payments market.

A number of innovations are taking place in the area of retail payments that have the potential to challenge this state of affairs. The one with the greatest implications is the ‘stablecoin’ Libra, which may not be as risk-free as a central bank liability, but would be backed by a mix of reasonably safe assets with low volatility and stable purchasing power. Furthermore, like cash, it could be used even by those who do not have bank accounts, and would allow instant transfer of money.⁸ With respect to cash it could make transactions much easier for consumers and merchants.⁹ The role of cash as legal tender could become less relevant with the growth of new instruments guaranteeing immediate transfer of financial assets.

The second important change is in the role central banks play with respect to the banking system. Currently only supervised institutions, mostly commercial banks, can open accounts with central banks. The provision of central bank money to banks implies a vertical ‘pyramid-like’ structure of the monetary sector, in which commercial banks are intermediaries in the payments made by private customers and central banks serve as settlement agent for payments among banks. This structure gives central banks special responsibilities with regard to the whole system and justifies the catalytic and operational roles most of them play with respect to payment systems.¹⁰ It also gives them the possibility to exercise oversight over the functioning of the payment system to prevent security breaches or other forms of malfunctioning. In a possible future configuration, tech companies could use their platforms to create parallel systems as alternatives to traditional systems. Their capacity to reach a vast number of clients would put the ‘pyramid under siege’.¹¹ Central banks’ capacity

8 European Central Bank (ECB), *Implications of Digitalisation in Retail Payments for the Eurosystem’s Catalyst Role*, Frankfurt am Main, ECB, July 2019, <https://op.europa.eu/s/or2s>.

9 Another category of entrants are the providers of digital wallets which are based on bank money but allow users to make instant payments on their bank accounts, using their phones or other portable electronic devices. For an overview and assessment of the instruments offered by big tech companies see Nicola Bilotta and Simone Romano, eds, *The Rise of Tech Giants. A Game Changer in Global Finance and Politics*, Bern, Peter Lang, 2019.

10 Many, central banks, like the Eurosystem, directly operate the interbank payment system (the T2 system in Europe). Others do not directly operate the system but have special powers of supervision and regulation over privately operated systems.

11 Curzio Giannini, *The Age of Central Banks*, cit.

not only to ensure the well functioning of the payment system but also to regulate the money in circulation or to influence credit conditions could be weakened, especially if the new players would have access to global markets for their funding needs.

The response to these challenges requires first of all a regulatory and supervisory framework extended to the new entrants in the payment system. A parallel evolution would be for central banks to offer the public a central bank digital currency (CBDC), a central bank liability that can be mobilised electronically. Even if done indirectly, by leaving the technical interface with final customers to commercial banks, it would still mean a generalised use of a central bank liability.

The substitution of bank deposits with central bank money could increase the financing capacity of central banks and reduce that of commercial banks. This could have various implications. First of all central banks would have to change their lending and investment practices, which are at present motivated mainly by monetary policy considerations and are designed to shield them from political pressures to finance the state or certain sectors of the economy.¹² Second, it could become more expensive for commercial banks to lend to the private sector, because the banks would have to pay higher interest rates on their deposits or rely more on capital markets, in direct competition with other financial intermediaries. Finally there is a fear that a central bank currency alternative to bank deposits could amplify financial instability, because it could facilitate the transfer of funds from bank deposits to central bank accounts during crises.

As it will be argued, these issues need to be carefully considered for the case of a digital euro, given the bank-based model of the European financial system, the absence of developed and integrated capital markets and the risks of banking systems' fragmentation during crises.

5.2 The changing retail payments landscape in Europe

The reason why the central banks of some countries, such as Sweden or China, have made more progress in their digital currency projects is that in those countries the use of cash is rapidly declining and large internet providers are gaining

12 The principle of central banks' autonomy states that central banks should refrain from financing the state's budget deficits and from conducting commercial business with non-bank customers. To prevent misallocation of resources, commercial banking and central banking should be clearly separated.

a dominant position in the monetary system. In Europe, the situation is very different. First, a recent rapid increase in the availability of alternative instruments has been paralleled by continued growth of cash use. Second, the use of cards in the eurozone is not as widespread as in countries like the United States or the United Kingdom, and varies greatly from country to country. Third, the pace of innovation is accelerating, but it is mostly at the local or national levels. Finally banks' most promising initiatives, such as those in the area of instant payments, are still highly fragmented along national lines. The risk is that innovative new players will operate mostly at the local level while global players will dominate the Europe-wide market, as has happened with major credit card brands.

Cash is still the preferred instrument for small transactions and it is increasingly being hoarded amid decreasing interest rates and higher uncertainty.¹³ The situation however is very different from country to country. Austria, Germany, Italy and Ireland have a marked preference for cash, while in the Netherlands its use is rapidly declining. Beyond the eurozone, cash is close to disappearing in Sweden.¹⁴

The use of card payments in the eurozone is far less widespread than in other regions of the world. In 2016, it amounted to 15.6 per cent of combined gross domestic product, in contrast to 45.5 per cent in the UK and 31.7 per cent in the US.¹⁵ The use of cards varies considerably within the eurozone. In 2018, the number of payments by card per capita ranged from between 332 in Finland and 275 in the Netherlands, to around 64 in Italy and Germany.¹⁶

There are however signs of accelerating change, especially because the COVID-19 crisis has given a major impetus to the use of online transactions

13 Roberto Rinaldi, 'Cash', in *Luiss SEP Working Papers*, No. 9/2019 (24 May 2019), <https://sep.luiss.it/node/2437>. The ratio of cash to GDP is higher in the eurozone than in the US, but in both economies has been increasing – between 2005 and 2017 it has gone from 6.3 to 8.2 per cent in the United States and from 7.1 to 10.7 per cent in the eurozone – mainly because of the reduction of interest rates and other macroeconomic factors.

14 European Commission, *A New Vision for Europe's Capital Markets. Final Report of the High Level Forum on the Capital Markets Union*, June 2020, <https://europa.eu/!gU33Hm>; Roberto Rinaldi, 'Cash', cit.

15 BIS data reported by Ferdinando Giugliano, 'Europe Is Planning Its Very Own E-Currency', in *Bloomberg Opinions*, 16 November 2020, <https://www.bloomberg.com/opinion/articles/2020-11-16/christine-lagarde-s-ecb-is-planning-its-very-own-e-currency>.

16 Not including Luxembourg which, with 5,276 card payments per year is a clear outlier. Banca d'Italia, *Appendice alla Relazione annuale sul 2019*, 29 May 2020, p. 101, <https://www.bancaditalia.it/publicazioni/relazione-annuale/2019/index.html>.

and contactless instruments. Consumers prefer them for safety reasons and merchants and business owners view faster payments as a way to reduce the settlement risk in a deteriorating business environment.

The crisis has accelerated the technological innovation that was already taking place in fintech, and in the area of electronic money, mostly at the local level.¹⁷ A recent ECB report shows the majority (45 per cent) of fintech initiatives in the area of retail payments are offered by local start-ups, while banks and banking associations come second with a third of the total.¹⁸ Start-ups have an especially significant share of cross-currency solutions, in which banks lag far behind.¹⁹ This trend has been encouraged by the second Payment System Directive (PSD2), which has allowed the co-existence of third-party providers and banks in the provision of payment and payment-related services.

Banks are responding, most notably by pushing for instant payments, but there is still considerable fragmentation along national lines.²⁰ As the European Commission reports,

many citizens still face unacceptable refusals of cross-border SEPA Direct Debit transactions ('IBAN [International Bank Account Number] discrimination'). This means that they cannot use IBANs from a different country to make a payment. Payees are still often unwilling or not technically able to accept cross-border SEPA Direct Debits.²¹

In 2017 the European Payments Council (EPC) developed a scheme to enable instant money transfers without exchanging IBANs. However participation has been rather limited and the European Commission is considering making it compulsory.²²

17 Oxera Consulting, *The Competitive Landscape for Payments: A European Perspective*, March 2020, <https://www.oxera.com/?p=131237>.

18 ECB, *Implications of Digitalisation in Retail Payments for the Eurosystem's Catalyst Role*, cit.

19 'As the current correspondent banking model is widely perceived as profitable and constitutes a relatively high market barrier, current players may have little incentive to devise new fintech solutions in this field in the absence of competitive pressure. Therefore, in this domain we can identify fintech start-ups as real competitors to banks.' *Ibid.*, p. 15.

20 Many banks are responding by creating partnerships and joint products with fintech companies and provider of electronic money.

21 European Commission, *On a Retail Payments Strategy for the EU* (COM/2020/592), 24 September 2020, p. 10, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0592>.

22 The participation has been insufficient either because of their voluntary nature or because the alternative of the IBAN is the QR-codes which are not standardised at

Another trend is the growing popularity of services offered by big players with a strong customer base, mainly driven by their vast social or commercial networks. For example, PayPal has a strong presence in Germany and in Italy where it manages 52 per cent and 32 per cent respectively of all e-commerce.²³ Another possible development is greater penetration into financial services by big tech companies with well-established digital interaction with customers. The most prominent example is that of Amazon, which has created its own online payment platform (Amazon Payments), open to customers and merchants.²⁴

In conclusion, in the European Union there is rapid innovation at the local level, but there is a concrete risk that the pan-European market for digital payments for digital payments will be taken over by global players.

5.3 The central bank digital euro

These trends in the European payments landscape help explain the motivation of the ECB. At this stage the ECB has presented a study, open for consultations, which could prepare the ECB to deploy a digital euro 'should the need arise'. In mid-2021 the European System of Central Banks (Eurosysteem) will decide whether to implement the project.

Motivations

Most commentators have focused on the 'defensive' motivation. Indeed the ECB has stressed the need to preserve the integrity of the monetary system which, as mentioned in the previous paragraph, could be challenged by global players. These could be operators of big Internet platforms, dominant card schemes or stablecoin suppliers. A recent G7 report has highlighted several risks related to the issuance of stablecoins.²⁵ However, given Facebook's ability to reach millions,

EU level. In addition, the providers of mobile devices limit the access to Near Field Communication technology. Ibid., p. 7.

23 Oxera Consulting, *The Competitive Landscape for Payments: A European Perspective*, cit.

24 ECB, *Implications of Digitalisation in Retail Payments for the Eurosystem's Catalyst Role*, cit.

25 They could lead to monetary substitution and financial instability, and also weaken countries' ability to execute monetary policy. From a regulatory point of view there would be problems in assessing their compliance with anti-money laundering (AML) and counter-terrorism financing rules. Instead of fostering competition, they may end up weakening it. See G7 Working Group on Stablecoins, 'Investigating the Impact of Global Stablecoins', in *CPMI Papers*, No. 187 (18 October 2019), <https://www.bis.org/cpmi/publ/d187.htm>.

if not billions, of customers, its stablecoin Libra could rapidly gain popularity with the public. Another challenge could come from the digital currency issued by ‘early mover’ foreign central banks, which could attract domestic users.

However, another important motivation is to overcome the existing fragmentation and to recover the ECB’s catalytic role in promoting Europe-wide initiatives in a market that is highly dynamic, but mostly at the local level. At the same time, a digital euro could foster the international role of the euro or, in the ECB’s language, support the ‘strategic autonomy’ of the European Union.²⁶

Another important consideration would be improvement in the transmission mechanism of monetary policy to the real economy. While deposit rates now react very slowly to changes in reference rates, with a remunerated digital currency, changes in central bank policy rates would be directly reflected in the rates households and businesses receive.

The ECB has clarified that the new central bank currency would complement, but not replace cash. This is inevitable, because there are an estimated 30 million adults in the EU who do not have bank accounts.

Furthermore, the ECB has stressed that the new currency would complement private digital instruments and enhance competition, rather than suppressing it by creating a public monopoly. ‘The prospect of central bank initiatives to issue a digital euro should neither discourage nor crowd out private solutions for efficient digital retail payments in the euro area.’²⁷ The ECB has gone so far as to state that a digital euro might not be issued if alternative solutions become available.

Main features

The CBDC would be a central bank liability accessible not just to banks, but to all citizens and firms. Unlike cash, it would function both as a means of payment and as a remunerated financial asset.

Technical details have yet to be specified regarding two main issues. The first is whether it should be a bearer instrument similar to cash or an account-based system similar to electronically accessible bank deposits (or both). The second is whether this access should be direct, or intermediated by banks and other financial institutions.

26 For an overview of the benefits of the status of international currency, and of why the euro has not yet attained it, see Stefano Micossi, ‘An International Role for the Euro?’, in *Luiss SEP Policy Briefs*, No. 37/2020 (2 October 2020), <https://sep.luiss.it/node/3132>.

27 ECB, *Report on a Digital Euro*, cit., p. 8.

The bearer payment tool could operate by means of an instrument – a ‘token’ – to be used offline. It would represent the logical successor to the banknote and could require the storage of a certain amount of euro in a digital wallet which would be replenished through an online account. The offline instrument, like a digital wallet, would need online access to add funds in the wallet.²⁸ Alternatively, the bearer instrument could operate through an internet connection with the ECB accounts available at the points of sale. It would be free of charge for basic use and would be a ‘simple, risk-free and trusted digital means of payment, accepted throughout the euro area.’ Depending on its technical specifications, the instrument could also be used by those who currently do not have bank accounts.

In principle the ECB could open an account directly with all the users of the digital euro. It would however be very technically challenging and also not desirable because of the risks implied. The model that the ECB, like most central banks, is considering for the account-based digital euro is a two-tier system in which banks have direct access to central bank accounts and manage the interface with the customers’ accounts with the central bank. In this way banks could retain their relationships with customers for value-added services.

A possibility would be to use the instant payment settlement system launched in November 2018 as an extension to retail payments of the Target 2 system. In its current configuration the TARGET Instant Payment Settlement (TIPS) system would allow money to be credited to recipients’ account within seconds and could potentially settle 500 payments per second (some 43 million transactions a day) in central bank money. Unlike T2, it could also be a multi-currency system.²⁹

Anonymity and privacy

A web-based central bank digital euro would have to comply with current European regulations and legal obligations regarding money laundering. For large-value transactions in particular, the regulation makes the identification of users compulsory. Furthermore, the ECB intends to impose restrictions on some

28 It will be similar ‘to the current coexistence of (online) commercial bank deposits and’ (physical) cash that can be withdrawn from bank accounts via ATMs, the digital euro could be made available online and amounts loaded onto a physical device for offline use.’ Ibid., p. 34–35.

29 Outside the eurozone, the Riksbank has shown interest in using TIPS for its digital currency project and has announced that it will begin to settle instant payments in Swedish krona starting from May 2022.

categories of users, such as non-eurozone residents, and on some operations. To do this it will need to be able to identify users. The offline bearer instrument could remain anonymous.

The ECB stresses that the digital euro would have to respect the right to privacy. As stated by Panetta, 'A digital euro would increase privacy in digital payments thanks to the involvement of the central bank, which – unlike private suppliers of payment services – has no commercial interests related to consumer data.'³⁰ It also envisages an independent, neutral third party that could audit the system to monitor compliance with privacy rules.

5.4 Main challenges

As already mentioned, the introduction of a CBDC would have profound implications for commercial banks as well as for the way central banks operate and pursue policy objectives. For the digital currency of a monetary union, the complexities would be compounded by the differences in payment habits and banking structures in member countries.

Disintermediation of banks

As mentioned, one major concern about CBDCs is that they could lead to bank disintermediation, because the public would substitute bank deposits with CBDCs. To retain funding capacity, banks would have to offer higher interest rates, which could in turn force them to either increase the cost of loans or reduce the volume of lending. However, this outcome may not be very significant quantitatively and, to a certain extent, might even be desirable.

Only some categories of deposits, mostly sight deposits, are likely to migrate to the central bank, and banks would still retain savings accounts and could increase their reliance on wholesale funding.³¹

The availability of an alternative medium for sight deposits would also incentivise banks to offer more innovative payment services and enrich their financial product offerings. A number of banks are already offering value added services

30 Fabio Panetta, *A Digital Euro for the Digital Era*, Introductory Statement at the ECON Committee of the European Parliament, Frankfurt am Main, 12 October 2020, https://www.ecb.europa.eu/press/key/date/2020/html/ecb.sp201012_1~1d14637163.en.html.

31 See Fabio Panetta, '21st Century Cash: Central Banking, Technological Innovation and Digital Currencies', in *SUERF Policy Notes*, No. 40 (August 2018), <https://www.suerf.org/policynotes/3251/21st-century-cash-central-banking-technological-innovation-and-digital-currencies>.

in addition to payment services including pre-transaction and post-transaction services or credit related services.³²

Banks would also have to gradually move away from the classic intermediation model, based on a maturity mismatch between assets and liabilities, wherein they finance long-term investments while serving investors' short-term liquidity needs. On the one hand they could offer or intermediate a wider range of financial and savings instruments to the public. On the other they could help corporate clients gain better access to capital markets, or complement the products they offer with those available in the capital markets. A review of the regulations in some specific sectors, such as those regarding securitisation, could facilitate this process.

This would be a desirable development in Europe given the abnormal share of banks in the financial system and the well-known shortcomings of bank-based financial systems, especially at time of crisis. According to some estimates the ratio of total bank assets to GDP is three times bigger in the EU than in the United States.³³ Securitisation would be a particularly useful tool for banks, allowing them to transfer illiquid loans to investors.³⁴ Currently, securitisation represents only 3 per cent of GDP in the EU-27, as opposed to 12.5 per cent in the United States and 12 per cent in the UK.³⁵

Some technical features of the new currency could also be designed for a smooth disintermediation. One possibility would be for the ECB to introduce quantitative limits for different categories of customers and differentiated interest rates. For example, Bindseil and Panetta suggest setting a limit of up to

32 Pre-transaction services include identification of parties, management of payment data, choice of payment instruments, electronic invoicing and ex-ante compliance process. Post-transaction services relate to the provision of electronic receipts, management of complaints and cancellations, and additional commercial offers. See ECB), *Implications of Digitalisation in Retail Payments for the Eurosystem's Catalyst Role*, cit.

33 According to Langfield and Pagano, the total assets of banks in the EU amounted to 334 per cent of the GDP in 2013, as opposed to the 196 per cent for Japanese banks and 86 per cent for US banks. Converting the US figure to international accounting, the size of the US banking system would reach 115 per cent of US GDP, still only about a third of the size of Europe's banking system. See Sam Langfield and Marco Pagano, 'Bank Bias in Europe: Effects on Systemic Risk and Growth', in *ECB Working Paper Series*, No. 1797 (May 2015), <https://www.ecb.europa.eu/pub/pdf/scpwp/cebwp1797.en.pdf>.

34 Securitisation implies the repackaging of these assets and dividing the resulting security into tranches with different risk profiles.

35 European Commission, *A New Vision for Europe's Capital Markets*, cit., p. 57.

3,000 euro per capita, which would cover the average monthly net income of eurozone households.³⁶ The interest rate applied to this amount would be zero, while for larger amounts, which would be reserved for categories of users other than households, interest would be lower, or even negative, to discourage holding digital currency for investment purposes.

Expansion of central banks' balance sheets

If a CBDC were meant mainly to replace banknotes, the size and composition of the central bank's balance sheet would not change substantially. However, it could greatly increase if non-residents shifted part of their portfolios into the national CBDC or if the public moved commercial bank deposits held for transaction purposes to the CBDC.³⁷ This hardly seems to be a problem at a time when central bank's balance sheets are bulging. However, changes in lending and investment policies of central banks may have important institutional implications. Certainly, central banks could not take over the function of lenders to the private sector, which would lead to misallocation of resources and crowding out of a key function of commercial banks.³⁸

The most immediate possibility would be of the ECB using the additional funds to increase loans to banks. This solution would preserve the separation of roles between central banks and commercial banks, but could be problematic from several points of view. First, the collateral banks could offer, especially in its loan component, could not be of the high quality that the ECB usually requires. Second, it would represent an important change in the ECB's current lending policies, which are exclusively aimed at fulfilling the ECB's monetary and financial stability objectives. Current long-term maturities – up to three years for long-term repo operations or LTROs – are justified only by monetary policy considerations, i.e. the need to avoid a prolonged deviation from the inflation target.

36 'For corporates (financial non-banks and non-financials) the tier one allowance could be set to zero, or it might be calculated to be proportional to a measure of their size and, thus, presumed payment needs. Foreigners could be allowed to hold CBDC, but should not have any tier one allowance.' See Ulrich Bindseil and Fabio Panetta, 'Central Bank Digital Currency Remuneration in a World with Low or Negative Nominal Interest Rates', in *VoxEU*, 5 October 2020, <https://voxeu.org/node/66304>.

37 The exception is the component of these assets represented by banks' liquidity in the form of banks' reserves with the central bank.

38 Agustín Carstens, *The Future of Money and Payments*, Speech at the Central Bank of Ireland, 2019 Whitaker Lecture, Dublin, 22 March 2019, <https://www.bis.org/speeches/sp190322.htm>.

Finally, complex conflicts of interests would arise if the ECB were to become a 'structural' long-term investor in the banks it supervises.

The other asset the Eurosystem could acquire are government securities. Currently, the Eurosystem's portfolio includes a huge volume of public bonds which have been acquired almost exclusively as a result of quantitative easing operations rather than to finance states, which it is not allowed to do. It could also increase its investments in corporate bonds, but given the lack of depth of European capital markets, this could excessively reduce the quantity of corporate bonds held in private banks.³⁹ A deep securitisation market could greatly help in this respect, because it would allow the ECB to subscribe to a less risky and highly liquid tranche of securitised assets.

Overall, this problem does not seem to be insurmountable, especially if limits were imposed on the amount of the digital currency the public could access. Probably the best option for the central bank would be a proper combination of all the previously mentioned options, following some transparent rules of diversification and principles of market neutrality. Furthermore, from this point of view, the development of deeper and more highly integrated capital markets would be crucial for Europe.

Financial instability and volatility of capital flows.

Another concern is that the digital euro could increase the risk of bank runs. During a confidence crisis, bank customers would no longer have to form long queues to withdraw cash at bank branches or ATMs – they could do it electronically from the comfort of home. This possibility already de facto exists for large value deposits, which can at any time be converted to Treasury bills or other low-risk assets. This would become available to the public at large, and for small-value deposits which could be easily converted into risk-free CBDC.

A shift from bank deposits into cash is not a remote possibility. It happened in 2008, when flights from bank deposits peaked after the collapse of Lehman Brothers and remained high during the 2010–13 sovereign debt crisis.⁴⁰

39 It could also increase investments in non euro area bonds but this would expose the ECB to the risk of exchange rate volatility. See Santiago Fernández de Lis and Olga Gouveia, 'Central Bank Digital Currencies: Features, Options, Pros and Cons', in *BBVA Working Papers*, No. 19/04 (March 2019), <https://www.bbva-research.com/en/publicaciones/central-bank-digital-currencies-features-options-pros-and-cons>.

40 Roberto Rinaldi, 'Cash', cit.

Quantitative limits on the use of the CBDC or its remuneration could limit this risk. The ECB believes that a variable remuneration system could be used to reduce the conversion of bank deposits into CBDC at times of crisis.⁴¹ However a rate change of this kind would be a very sensitive instrument to use during banking crises because of the signal it would send to the markets about the concerns of the central bank, based on the granular information at its disposal, which is not always publicly available.⁴²

At the same time, it is very unlikely that a run on banks would become generalised across the eurozone. Most likely it would affect either individual institutions or the entire banking systems of some member countries. In the former case, strengthened traditional instruments of lending of last resort could be sufficient. In the latter case it would certainly be very difficult to reduce the remuneration of the digital currency in the entire eurozone in response to financial instability in a few member countries.

The exposure of the eurozone to the risk of fragmented banking crises is a well-known problem, and policy actions to address it are well known, but there is no consensus on how to implement them. They include completing the banking union, in particular introducing cross-border deposit insurance, a sustainable crisis resolution mechanism for banks and a stronger public backstop in case of a systemic crisis. Because of the possible impact on financial instability, the creation of a digital euro requires further progress on all these fronts.

Reputational risks

Perhaps the main risks for the ECB would be that the new currency will not be successful among the public. Countries that are more cash-oriented would continue to use cash, while countries that already use digital instruments would continue to use them, because of the value-added services they offer with respect to the CBDC and the less stringent quantitative limitations. This risk will be higher the longer it will take to actually implement the project, because in the current

41 A variable rate could also help limit sudden inflows of money, which could cause an undesirable appreciation of exchange rates. It has been shown that the introduction of CBDCs facilitates international arbitrage that links together interest rates, the exchange rate and the remuneration of the CBDC. See Massimo Minesso Ferrari, Arnaud Mehl and Livio Stracca, 'The International Dimension of a Central Bank Digital Currency', in *VoxEU*, 12 October 2020, <https://voxeu.org/node/66335>.

42 A similar problem would arise with changes in the quantitative limits which would raise the same concerns as a reintroduction of capital controls, with all the problems of enforceability and circumvention that this would imply.

dynamic environment the first mover, be it a private entity or a foreign central bank, could acquire a lasting dominant position.

Another important risk is the possible breakdown or malfunctioning of the IT systems on which the CBDC is built. Events of this kind unfortunately do occur even in the best regulated and supervised market infrastructures, like stock exchanges, and clearing or settlement networks. This would have high reputational costs, because a sudden inability to use the currency, even for a few hours, would foster strong public resentment against the ECB. There is also the issue of whether the central bank could be held responsible for economic losses suffered by some users. Another problem could arise if the CBDC, at least the component covered by anonymity, were used for illegal activities like tax evasion, drug trafficking, money laundering, and financing terrorism.

A digital currency could also become a key target for cyberattacks because of its relevance to the economy of the entire eurozone. Terrorist groups or hostile nation-states could develop the capacity to use this as a warfare instrument or as a tool for extortion. Of course this risk would exist even with private systems, and a public entity like the Eurosystem would be better equipped to defend itself because of its role in the operation of major platforms like T2 or T2S. Nevertheless, such risks can never be completely eliminated. There would therefore be an obvious need to strengthen common deterrence tools in the eurozone, and develop a common intelligence pool that would collect intelligence gathered by the various member states.

To mitigate these risks, the construction of the new platform will require huge investments in technology. It would be important to clearly disclose whether the returns on these investments, including social benefits, justify those costs.

Conclusion

The new digital currency will be an opportunity to greatly improve the efficiency of the European payment system which, in its retail component, has been highly innovative but is still highly fragmented along national lines. It could also improve the transmission mechanism of monetary policy and the role of the euro as an international currency. The initiative is timely, because doing nothing would amplify the risk that the only Europe-wide digital payment schemes would be those offered by global private institutions or foreign central banks.

One of the main challenges will be limiting bank disintermediation. Although this risk has probably been overstated in the CBDC debate, it is a critical issue for Europe because of the high reliance on bank intermediation of European

enterprises, especially the SMEs that form the bulk of the industrial sector in many member countries. Also the risks of instability should not be underestimated because the recent experience shows that when they materialize they result in fragmentation of banking markets along national borders. Whether the CBDC could exacerbate these risks requires further analysis, but at the same time it would not be easy to design measures to mitigate them, like variable interest rates on the CBDC, whose impact would greatly differ from country to country.

The digital currency could be designed to facilitate a gradual adaptation of the banking system to the new environment. However, both the banking sector and the corporate sector will eventually have to increase their reliance on capital markets for funding needs. The ECB will also have to rely more on capital market instruments to diversify the investments of the additional funds which it will have at its disposal. The launch a digital euro, therefore, should not been seen in isolation from the efforts to remove the obstacles to the Capital Markets Union. The launch of the currency also needs to be complemented by the completion of the banking union, in order limit the risks of financial markets instability and strengthen the role of the euro as an international currency.

Perhaps the biggest risk is that the digital euro will not win over the public, because those who prefer cash will continue to use it and those used to innovative digital instruments will not abandon them. More than the legal tender status of the new currency, what will matter is the technical design, the protection of privacy, the ease of use, the perceived risks for users, the cost to the public of the new instrument and its timely implementation.

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