

Digital Euro, Monetary Objects, and Price Stability: A Legal Analysis

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ABSTRACT

The Eurosystem is mandated to safeguard price stability according to article 127 of the Treaty on the Functioning of the European Union (TFEU). Based on a theoretical and policy-oriented approach, this article sheds light on a second public good with enormous practical relevance both for financial markets and institutions as well as for the general public that the Eurosystem, and ultimately the European Central Bank (ECB), must safeguard according to article 128 TFEU: the availability of ideal monetary objects for the public. While monetary policy constitutes the instrument used to keep prices stable, the availability of ideal monetary objects is ensured through the issuance of ‘cash’ that serves as both money with selected properties and an anchor for other monies of the same currency, including sight deposits at commercial banks. Today, the role of ideal monetary objects is (still) primarily fulfilled by tangible banknotes. As the use of tangible banknotes declines, however, a digital equivalent and complement—a digital euro—becomes increasingly necessary. Accordingly, the article concludes that the ECB is both entitled and obliged *de lege lata* to issue a digital euro on the basis of article 128 TFEU. It further explains that neither tangible cash nor a digital euro can simultaneously be used as instruments in themselves to maintain price stability.

KEYWORDS: cash; banknotes; CBDC; monetary policy; digital Euro (e-Euro); European Central Bank (ECB)

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1. INTRODUCTION

The digital euro is no longer a vague concept of a distant future. Like other central banks, the European Central Bank (ECB) is actively pursuing the possibility of complementing euro cash with a digital equivalent, a so-called retail central bank digital currency (rCBDC).¹ The most pressing motive for the issuance of a digital euro is likely to be the accelerating decline in the demand for cash.² For over a century, this decline has gone hand in hand with a corresponding rise in private money in the form of sight deposits at commercial banks (henceforth ‘deposits’).³ Recent technological, economic, and monetary innovations,⁴ and the Covid-19 crisis seem to have reinforced such pre-existing trends.⁵ Some of these multi-layered reasons and motives are briefly described below.

First, a growing number of *public law measures* restrict or even exclude the use of cash (although being legal tender)⁶ and facilitate or require payments by means of deposits.⁷ For instance, EU Member States participating in the euro financially incentivize transactions by electronic means of payment for the purpose of combatting

- 1 ECB, ‘Report on a digital euro’ (2 October 2020) <https://www.ecb.europa.eu/pub/pdf/other/Report_on_a_digital_euro~4d7268b458.en.pdf>. All websites accessed on 17 September 2021 unless noted otherwise.
- 2 Space prevents a detailed description of the factors contributing to this decline. Instead we refer in this regard to the publications mentioned in nn 5–22.
- 3 The potential consequences of a full replacement of tangible cash by deposits will be discussed in particular in sections II.3 and II.4. Regarding the evolution of banking and the present monetary system—with the distinctions between commercial and central bank money, as well as between tangible cash and scriptural money—see Benjamin Geva, ‘Cryptocurrencies and the Evolution of Banking, Money and Payments’ in Chris Brummer (ed), *Cryptoassets Legal, Regulatory and Monetary Perspectives* (OUP 2019) 11–38 and 341–66.
- 4 For an overview with regard to Bitcoin and other decentralized cryptocurrencies, Facebook’s plans to launch a digital currency (Libra/Diem) and China’s piloting of a CBDC (DC/EP) see eg John Crawford, Lev Menand and Morgan Ricks, ‘FedAccounts: Digital Dollars’ (2021) 89 *The George Washington Law Review* 113, 114ff with further references.
- 5 ECB, ‘ERPB response to the current Covid19 pandemic’ (June 2020) ERPB/2020/009 <https://www.ecb.europa.eu/paym/groups/erpb/shared/pdf/13th-ERPb-meeting/Item_2_-_ERPb_response_to_the_current_Covid19_pandemic.pdf>; Sébastien Kraenzlin, Christoph Meyer and Thomas Nellen, ‘COVID-19 and regional shifts in Swiss retail payments’, SNB Working Papers 15/2020 <https://www.snb.ch/n/mmr/reference/working_paper_2020_15/source/working_paper_2020_15.n.pdf>; Raphael Auer, Giulio Cornelli and Jon Frost, ‘Covid-19, cash, and the future of payments’ (2020) *BIS Bulletin* No 3 (3 April 2020) <<https://www.bis.org/publ/bisbull03.htm>>. See also Henk Esselink and Lola Hernández, ‘The use of cash by households in the euro area’ ECB Occasional Paper Series No 201 (28 November 2017) <<https://www.ecb.europa.eu/pub/pdf/scpops/ecb.op201.en.pdf>>. Re the share of cash in M1 in selected economies, see eg Peter Wierts and Harro Boven, ‘Central Bank Digital Currency: objectives, preconditions and design choices’ *De Nederlandsche Bank Occasional Studies* (29 April 2020) vol 20-01, 12 <https://www.dnb.nl/en/binaries/Os%20Central%20Bank%20Digital%20Currency_tcm47-388408.PDF>.
- 6 See eg joined cases C-422/19 and C-423/19 *Johannes Dietrich and Norbert Häring v Hessischer Rundfunk* ECLI:EU:C:2021:63.
- 7 Recital 19 of Council Regulation (EC) No 974/98 of 3 May 1998 on the introduction of the euro, [1998] OJ L139/1 states that it should not be incompatible with the status of legal tender of euro banknotes and coins if Member States introduce limits on payments in banknotes and coins for reasons of public policy. Helmut Siekmann, ‘Restricting the Use of Cash in the European Monetary Union’ IMFS Working Paper Series No 108 (2016) 15ff, has rightly questioned the authority of this provision. But the ECB acknowledges deposits as ‘other lawful means for the settlement of monetary debts’, see eg recently CON/2020/33 (Denmark) and earlier ECB opinions cited in Corinne Zellweger-Gutknecht, Benjamin Geva and Seraina Grünewald, ‘The ECB and € E-Banknotes’ (1 August 2020), fn 16 <<http://dx.doi.org/10.2139/ssrn.3671007>>.

tax evasion.⁸ Similarly, Member States with tight financial budgets, in particular, have introduced cash ceilings under the heading of combatting tax offences, money laundering, and the financing of terrorism.⁹ Even in Member States without such ceilings, cash payments above certain levels require due diligence measures such as Know Your Customer (KYC)—increasingly also seen outside the financial sector—thereby further complicating the handling of cash.¹⁰

Second, measures rooted in *monetary law* may have prompted people to convert cash definitively into deposits. Such measures include repeated cash changeovers with very short exchange periods;¹¹ the fading out of high value banknotes and placing their use under a sense of general suspicion;¹² and downgrading access to cash services from a legal guarantee to a policy objective¹³ or delegating it to the banking sector, whose business model is not based on promoting cash turnover.¹⁴

Third, the inherent *characteristics of deposits* themselves have contributed to an impressive rise in demand in recent decades. Today, their share in M1 (i.e. banknotes and coins, as well as deposits which can immediately be converted into cash or used for cashless payments) ranges from 80 per cent up to more than 95 per cent.¹⁵ In addition

8 Critical in this regard, see Yves Mersch in a letter on behalf of the ECB of 14 December 2020 <<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELLAR:f418aba3-4054-11eb-b27b-01aa75ed71a1&from=ES>>.

9 For an illustrative list of Member State legislation in Italy, Portugal, Greece, France, Spain, Slovenia, Slovakia, Latvia, and Belgium, see Zellweger-Gutknecht, Geva and Grünwald (n 7) fn 18.

10 See eg article 1 of Directive (EU) 2018/843 of the European Parliament and of the Council of 30 May 2018 amending Directive (EU) 2015/849 on the prevention of the use of the financial system for the purposes of money laundering or terrorist financing, and amending Directives 2009/138/EC and 2013/36/EU, [2018] OJ L156/43 (5th anti-money laundering Directive) and articles 2 and 11 of Directive (EU) 2015/849 of the European Parliament and of the Council of 20 May 2015 on the prevention of the use of the financial system for the purposes of money laundering or terrorist financing, amending Regulation (EU) No 648/2012 of the European Parliament and of the Council, and repealing Directive 2005/60/EC of the European Parliament and of the Council and Commission Directive 2006/70/EC, [2015] OJ L141/73 (4th anti-money laundering Directive).

11 John Paul Koning, 'Swedish betrayal' *Moneynews* (27 December 2018); see eg the tight schedule of the Swedish changeovers from 2009 to 2017: Sveriges Riksbank, 'Banknote and coin changeover in Sweden—Summary and evaluation' (March 2018) 20 (table 5).

12 ECB, Press release (4 May 2016); see also Jens Weidmann, 'Eröffnungsrede' in Deutsche Bundesbank Eurosystem (ed), 3 *Bargeldsymposium der Deutschen Bundesbank, Frankfurt Juli 2016* (Deutsche Bundesbank 2016) 9, 13.

13 In Sweden, the former legal guarantee of access to cash services, which was enshrined in SFS 2001:1276, was abandoned in favour of a purely political objective (prop 2006/07:55): Länsstyrelserna, *Bevakning av grundläggande betaltjänster* (2015) 22.

14 Paola Boel, 'Thinking about the future of money and potential implications for central banks' (2016) 1 *Sveriges Riksbank Economic Review* 147, 149; Björn Segendorf and Anna-Lena Wretman, 'The Swedish payment market in transformation' (2015) 3 *Sveriges Riksbank Economic Review* 48, 56 and 61; Sveriges Riksbank, 'Report on Cash Handling 2011' (December 2011) 7; Sveriges Riksbank, 'Review of the Retail Payment Market in Sweden' *Riksbank Studies* (June 2013) 104. Between 2011 and 2015, Swedish banks reduced the number of bank counters from 1415 to 328 and lowered the number of ATMs, so that by 2015 the average distance to the nearest ATM grew to 12 km. In addition, in 2008, the Riksbank closed its branches and the Post Office's subsidiary, Svensk Kassaservice, discontinued its counter services.

15 See eg Wierts and Boven (n 5) 12: in the Netherlands deposits accounted for 20% in 1900 while it stood at 84% in 2019; Joseph Huber, 'Dominant Money' (January 2020) <<http://dx.doi.org/10.2139/ssrn.3513411>> 3 and 9. In the UK, in March 2020 cash in M1 was at 3.64% with amounts outstanding of monetary financial institutions' sterling and all foreign

to the obvious convenience of avoiding physical transfer, storage, and the associated costs and risks of cash, technological innovations are enabling increasingly accessible options for non-cash payments and faster processing, even over long distances.¹⁶ Most importantly, however, the amount of deposits is extremely elastic due to the ability of commercial banks to create deposits by granting loans.¹⁷

Fourth, a decline in tangible cash in circulation may also be due to its increasing use as a store of value, especially in situations of uncertainty.¹⁸ In this context, a distinction must be made between hoarding and saving. In macroeconomic terms, *hoarding* prevents an optimal supply of liquidity to the economy, so that production lags behind its potential. The monetary authority may then, based on its mandate and using its policy instruments, reduce the hoarding ratio, notably by lowering interest rates (even into negative territory). *Saving* also keeps money out of the economic cycle; however, it would not be appropriate for a monetary authority to intervene by means of financial repression (such as lowering interest rates—even into negative territory—to *encourage* spending) as additional liquidity would not promote value creation. This is especially the case when there is no output gap or, worse, actual liquidity is allocated

currency (UK estimate of EMU aggregate) liabilities to private and public sectors not seasonally adjusted were at GBP 1948.612 billion <<https://www.bankofengland.co.uk/boeapps/data/base/FromShowColumns.asp?Travel=NIxAZxI1x&FromCategoryList=Yes&NewMeaningId=MF,MFIS&CatId=5&HighlightCatValueDisplay=Monetary%20financial%20institutions>>. Equivalent figures were, for example, Sweden 2%, Switzerland 8%. For absolute amounts per OECD-countries see <<https://data.oecd.org/money/narrow-money-m1.htm>>. The US, with its 40% cash ratio, is only apparently an exception, as most dollar notes are used abroad as a parallel currency and store of value: Federal Reserve, 'Money Stock Measures – H.6 Release' (March 2020), tables 1 and 3 <<https://www.federalreserve.gov/releases/h6/current>>; Huber (ibid) 9 with further reference: 'The share of cash has risen from 20% (sic) in the 1950/60s in parallel with the USD as the dominant world currency'.

- 16 BIS Committee on Payments and Market Infrastructures (CPMI), 'Fast payments – Enhancing the speed and availability of retail payments' (November 2016) 74 Annex 2 <<https://www.bis.org/cpmi/publ/d154.pdf>>. In contrast, central banks used to be quite restricted in their money creation due to the gold or gold-forex standard: Huber (n 15). In emerging markets the restriction still exists to date due to the US Treasury bill standard: Junji Tokunaga, 'The Revised U.S. Treasury Securities Standard System' (3 September 2019) University of Massachusetts Amherst Political Economy Research Institute Working Paper Series No 494 <https://www.researchgate.net/profile/Junji_Tokunaga/publication/335589650_The_Revised_US_Treasury_Securities_Standard_System/links/5d6eb9fd45851542789f7216/The-Revised-US-Treasury-Securities-Standard-System.pdf>.
- 17 See Michael McLeay, Amar Radia and Ryland Thomas, 'Money creation in the modern economy' (2014) 1 Bank of England Quarterly Bulletin 1.
- 18 For instance, since the outbreak of the financial crisis in 2008, there has been a substantial increase in the ratio of cash to nominal GDP: Aleksander Berentsen and Fabian Schär, 'The case for central bank electronic money and the non-case for central bank cryptocurrencies' (2018) 100(2) Fed Reserve Bank St Louis Review 97–106 <<https://research.stlouisfed.org/publications/review/2018/02/13/the-case-for-central-bank-electronic-money-and-the-non-case-for-central-bank-cryptocurrencies>>.

sub-optimally due to structural inefficiencies, for example, when banks or governments keep over-indebted companies with unprofitable business models alive.

Finally, *shadow banking* payment systems,¹⁹ including those with global aspirations and potential such as Facebook's stablecoin Diem, threaten to displace the use of local currency in the form of tangible cash and traditional deposits, respectively, in the near future. Similar to the phenomenon of unofficial dollarization, the public may begin to extensively use foreign (private or public) digital money²⁰ instead of state-issued banknotes and coins or deposits.²¹ Moreover, the public may switch to using digital private money without availing of the redemption option again—to the extent that such money offers users a comprehensive ecosystem.²² To forestall migration out of domestic public money, central banks around the world may consider issuing rCBDC. Creating a digital (and thus in many ways more convenient) equivalent of cash for the public is of particular importance to those central banks that aim for global use of their currency, which includes not only the Fed and the Bank of China, but also explicitly the ECB or the Eurosystem, respectively.²³

This article discusses from a legal and policy perspective why the developments mentioned above require a response from the monetary authorities in general and in particular from the ECB pursuant to the treaties and the Statute of the ECB and of

- 19 Dan Awrey and Zwieta Kristin, 'The Shadow Payment System' (2018) 43 *Journal of Corporation Law* 775; Marco Dell'Erba, 'Shadow Central Banking' (6 November) <https://papers.ssrn.com/sol3/papers.cfm?aabstract_id=3488040>.
- 20 For state issued options see eg Norges Bank, 'Central bank digital currencies' *Norges Bank Papers* 1/2018 (18 May 2018) 7 <<https://static.norges-bank.no/contentassets/166efadb3d73419c8c50f9471be26402/nbpapers-1-2018-centralbankdigitalcurrencies.pdf?v=05/18/2018121950&ft=.pdf>>; Huber (n 15) 21. Re private options backed with central bank money, see eg Sveriges Riksbank, *Payments in Sweden 2019* (7 November 2019) 18ff <<https://www.riksbank.se/globalassets/media/rapporter/sa-betalarsvenskarna/2019/engelska/payments-in-sweden-2019.pdf>> and the hypothetical example at Jacob Goldsmith, 'The IMF must develop best practices before government-backed cryptocurrencies destabilize the international monetary system' (2020) 34 *Emory International Law Review* 595, 595 <<https://law.emory.edu/eilr/content/volume-34/issue-2/comments/imf-best-practices-cryptocurrencies-international-monetary-system.html>>.
- 21 Markus K Brunnermeier, Harold James and Jean-Pierre Landau, 'The Digitalization of Money', NBER Working Paper No 26300 (September 2019) 32 <https://www.nber.org/system/files/working_papers/w26300/w26300.pdf>. In China, non-bank payment groups, such as AliPay (Alibaba) and WeChat Pay (Tencent), were already obliged in 2018 to transfer all customers' funds until then held with commercial banks to NetsUnion and China UnionPay. Both represent the reserve-based state clearing network and have since acted as custodians for customer funds, now covered by central bank reserves. See Huber (n 15) 24.
- 22 This scenario applies equally to all monies, irrespective of their unit of account and potential redeemability, if they only benefit from a widespread autonomous ecosystem. For the example of Libra, see Christian Hofmann, 'The Changing Concept of Money: A Threat to the Monetary System or an Opportunity for the Financial Sector?' (2020) 21 *EBOR* 37, 54–56 <<https://doi.org/10.1007/s40804-020-00182-z>>. See also Tommaso Mancini-Griffoli and others, *Casting Light on Central Bank Digital Currency*, IMF Staff Discussion Note 18/08 (November 2018) 9ff <<https://www.imf.org/~media/Files/Publications/SDN/2018/SDN1808.pdf>>; G7 Working Group on Stablecoins, *Investigating the impact of global stablecoins* (October 2019) passim <<https://www.bis.org/cpmi/publ/d187.pdf>>.
- 23 See ECB, 'Report on a digital euro' (n 1) 14, scenario 6 on 'the international role of the euro'.

Table 1. Selected objectives, measures, and instruments

	Level	Objectives	Measures	Instruments
Strategic	1	Stimulate trade and economic cooperation. Bind societies together to preclude future conflicts.	Establishment of unions (economic, monetary, political including fiscal federation) such as Economic and Monetary Union (EMU).	
	2	Restore/maintain stability of euro area.	Single currency.	
Operational	3	Stable prices.		Monetary policy.
		Ideal monetary objects.		Issuance of cash (so far tangible; in the future also digital).

the Eurosystem²⁴ (henceforth ‘Statute’).²⁵ To this end, in this article we investigate whether the issuance of a digital euro as a digital equivalent of tangible euro banknotes would *de lege lata* be justified in light of the objectives conferred upon the ECB, the National Central Banks (NCBs), and the Eurosystem,²⁶ thereby enabling these bodies to act.²⁷ We also explore whether non-issuance might affect the future fulfilment of such objectives and thus create an obligation to act for the bodies just mentioned.

Throughout the article, we distinguish objectives, measures, instruments, and supporting tasks. These terms are briefly explained and illustrated in Table 1. In this respect, we largely follow Adamski’s three-level scheme.²⁸

24 The ESCB comprises the ECB and the NCBs of Member States whose currency is the euro: article 139(2)(c) and (d) and 282 of the Consolidated Version of the Treaty on the Functioning of the European Union, [2008] OJ C115/13 (TFEU). Some provisions discussed hereafter such as article 127(1)–(3), (5), and 128 do not apply for non-Eurosystem-Member States: article 139(2) TFEU.

25 Statute of the European System of Central Banks and of the European Central Bank, Protocol 4 to the Treaty on European Union, [2016] OJ C202/203. The Statute is similarly part of the primary law, to ensure the proper functioning of economic and monetary union: Rosa Maria Lastra, *International Financial and Monetary Law* (2nd edn, OUP 2015) para 7.86 and in general 2.88.

26 In the latter case to be implemented either by the ECB or through the NCBs, see article 9.2 of the Statute and eg n 37.

27 Regarding the question of whether the Eurosystem is empowered to issue a digital euro see Seraina Grünwald, Corinne Zellweger-Gutknecht and Benjamin Geva, ‘Digital euro and ECB powers’ *Common Market Law Review* 58: 1029–1056, 2021 unedited version available on SSRN <<https://ssrn.com/abstract=3807855>>.

28 Dariusz Adamski, ‘Objectives of the EMU’ in Fabian Amtenbrink and Christoph Herrmann (eds), *The EU Law of Economic and Monetary Union* (OUP 2020) 214. See, however, n 39.

According to that scheme, Level 1 encompasses two overarching European objectives: (1) to stimulate trade and economic cooperation; and (2) to bind societies together to preclude future conflicts.²⁹ Given their strategic nature, these objectives cannot be pursued by instruments in the sense introduced by Tinbergen.³⁰ Rather, they require (political) measures such as the establishment of an economic union, a monetary union, and—ideally—a political union, including a fiscal federation.³¹

The Level 2 objectives were originally aimed at improving internal market performance, curbing German monetary dominance, and restraining domestic decision-makers from pursuing self-defeating macroeconomic policies.³² The sovereign debt crisis has reengineered these priorities, merging them into the current single objective of restoring and maintaining the stability of the euro area (in all its economic, financial, social, and political dimensions).³³ As far as this, still strategic, level is concerned, the single currency—the euro—has remained an indispensable measure to date: while its introduction was designed to meet the original Level 2 objectives, its continuation likewise promotes the current objective.³⁴

Level 3 relates to the operational level of the Economic and Monetary Union (EMU). Only at this stage are the objectives specific enough so that responsibility and instruments for achieving them can be defined.³⁵ In monetary terms,³⁶ the objective is to maintain stable prices, with monetary policy being the instrument assigned to the Eurosystem³⁷ to pursue this objective.³⁸ We argue, however, that another monetary objective exists in parallel: the availability of ideal monetary objects. This objective likewise requires a suitable instrument for its realization: the issuance of cash, which is mainly the responsibility of the ECB and the NCBs.³⁹ As we will demonstrate, ideal

29 Ibid para 9.1ff.

30 Jan Tinbergen, *On the Theory of Economic Policy* (North Holland Publishing Co 1952): instruments comprise policies and other tools and mechanisms, ideally with one available for each objective. See also Lastra (n 25) para 2.93.

31 Adamski (n 28) para 9.1ff and fn 9.

32 Ibid para 9.1ff and fn 9.

33 Ibid paras 9.9 and 9.58ff.

34 Ibid paras 9.9 and 9.49.

35 See section II.3. Wouter Bossu and others, *Legal aspects of Central Bank Digital Currency: Central Bank and Monetary Law Considerations*, IMW Working Paper WP/20254 (November 2020) 14 <<https://www.imf.org/en/Publications/WP/Issues/2020/11/20/Legal-Aspects-of-Central-Bank-Digital-Currency-Central-Bank-and-Monetary-Law-Considerations-49827>>.

36 In economic terms, these objectives include sound public finances, a sustainable balance of payments, and economic convergence. See Adamski (n 28) para 9.20.

37 See article 127(1) TFEU and article 12 of the Statute: within the Eurosystem, the Governing Council defines the monetary policy while its implementation is assigned to the Executive Board and the NCBs.

38 The objective of price stability is interpreted more widely since the sovereign debt crisis and tends to be understood as maintaining a stable currency. See Adamski (n 28) para 9.20 (traditional objective) and 9.58–9.65 with further references (redefined objective). He argues that the redefinition of the Level 2 objectives has also led to an extension at Level 3. However, the additional four ‘objectives’ he identifies in 9.64 and 9.124 (assistance funds, economic coordination, monetary policy redefinition, shock-absorbers) seem to us rather to be (extraordinary) supporting tasks (see section III.2) introduced to recreate an environment in which the original objectives can be (re)achieved using the original instruments.

39 See section II.2–II.4. Bossu and others (n 35) 14 overlook this aspect when they state that objectives ‘may appear less relevant, as the issuance of currency constitutes only a minor element of pursuing price stability’.

monetary objects and price stability are mutually dependent. Nevertheless, they must remain distinct since the instruments available for achieving these objectives and the related competencies are different.

To this three-level structure, we add the supporting tasks, which are subordinate in nature. They aim to create conditions under which an instrument can achieve an objective in the most effective way, for example, by giving cash certain properties so that it can function optimally as money and anchor, or by structuring the financial market with respect to authorities, market participants, and dissemination media (such as money and infrastructure) in such a way that monetary policy impulses can be effectively propagated. The creation of such conditions is neither an objective nor an instrument in itself, but a mere prerequisite for the instrument's proper implementation and the objective's achievement.

The rest of the article is organized as follows. Section II argues that at the operational level, the Eurosystem (and ultimately the ECB) has been assigned the objective of safeguarding a public good: the availability of ideal monetary objects for the public. Its achievement must be understood as a public service to be provided in the public interest. The instrument used to achieve this objective is the issuance of a monetary object that serves both as money with ideal properties and as an anchor for other monies of the same currency (eg deposits). This role is (still) fulfilled by cash today, in particular by tangible banknotes. As the use of cash declines, however, a digital equivalent—a digital euro—is increasingly required in addition to tangible banknotes to maintain the instrument's effectiveness. This article pursues a technology-neutral approach and refrains from analysing whether such a digital euro should be based on traditional technology or on distributed ledger technology (DLT) and, in the latter case, whether it should have a token-based or account-based design. Rather, we demonstrate in general terms which properties a digital euro should possess in order to perform a complementary function as an ideal monetary object—whatever technology and design might ultimately prove to be the best to achieve these properties.⁴⁰

Section III demonstrates that a monetary object with the properties and function just described cannot simultaneously be used as an instrument in itself to maintain price stability. Rather, the latter should be achieved using the instrument of monetary policy. In this regard, the issuance of tangible banknotes (and potentially a digital euro) merely qualifies as a supporting task that safeguards an efficient monetary policy and thus the maintenance of stable prices.

Section IV concludes by answering the following questions: can—or must—a digital euro for the public serve as an instrument to accomplish the objectives of (1) having ideal monetary objects available and (2) maintaining the price stability in the euro area? We answer the first question in the affirmative and the second in the negative.

40 On the question of technology (including non-DLT-based alternatives) and design (account and token) see Benjamin Geva, Seraina Grünewald and Corinne Zellweger-Gutknecht, 'The e-banknote as a "banknote": a monetary law interpreted' (forthcoming) *Oxford Journal of Legal Studies*, 2021 <<https://doi.org/10.1093/ojls/ggab019> unedited version available on SSRN <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3838739>.

2. OBJECTIVE: HAVING IDEAL MONETARY OBJECTS AVAILABLE

At the highest strategic level (Level 1), as a measure to achieve economic and social convergence among the Member States, the EMU was gradually established from 1990 onwards. In this context, the decision to introduce a single currency—the euro—was also taken, in order to achieve the underlying strategic objectives of European economic integration (Level 2).⁴¹ Having been discussed in theory since the mid-1960s, the exact scenario was finally decided on in 1995.⁴²

Below, we demonstrate that these strategic objectives and measures are also reflected at the operational level (Level 3): the ECB and the NCBs have been given the competence to issue banknotes as an instrument to ensure the availability of the best possible monetary objects—public and private. Before going into detail, however, we briefly explain what constitutes a currency in general and a single currency in particular (section II.1) and describe the essential properties of an ideal monetary object (section II.2).

3. Currency and its singleness

Currency owes its name to the legal peculiarity that property in money passes with the possession of that money, which is why money soon became to be called current in the sense of negotiability.⁴³ Today, the word ‘currency’ is mostly used in the sense of the official money of a State or a monetary union that is recognized as such under monetary law—independent of whether any of its monetary objects are attributed the status of legal tender.⁴⁴ In common English language the term is also used to denote banknotes and coins, ie the official monetary objects.⁴⁵

For a currency to come into existence, at the very least the name of the currency,⁴⁶ its unit(s) of account (or currency units),⁴⁷ and monetary object(s) must be defined and used to measure and express monetary value. The *name* designates the currency, while *currency units* describe the value ratio between the main unit and sub-units (eg euro and cents). In the past, currency units also had to determine the value ratio between themselves and the material used to create the *monetary objects* (eg in the case of a

41 See article 3 of the Treaty on European Union (TEU) and article 119(2), 133 and 140(3) TFEU.

42 Adamski (n 28) para 9.6ff.

43 See eg Henry Dunning Macleod, *The Principles of Economical Philosophy* (2nd edn, Longmans, Green, Reader and Dyer 1875) 386. That title to money is transferable by delivery bona fide and upon a valuable consideration is, therefore, an exception to the principle *nemo dat quod non habet*; Simon Gleeson, *The legal concept of money* (OUP 2018) paras 7.29ff.

44 See Gleeson (n 43) para 7.39 who includes near-money into the definition and reminds that ‘[c]ontext here is important’ because an asset which is negotiable in one respect when transferred within one market may not be regarded as negotiable when transferred in a different way in a different market. Consistent with Gleeson (para 7.29) but unlike Bossu and others (n 35) 8, we do not view legal tender status as an essential attribute of a currency: see section II.2.c.

45 Bossu and others (n 35) 28 and fn 58.

46 In German, ‘denomination’ is sometimes used in the sense of ‘name’, while in English, ‘denomination’ typically means the number of currency units expressed by a monetary object (corresponding to the German ‘*Stückelung*’). We follow the English terminology.

47 Bossu and others (n 35) 28 call it the ‘official monetary unit’.

precious metal currency, the fineness of the metal). With the advent of fiat currencies represented by monetary objects without intrinsic value, the latter aspect became obsolete. Finally, monetary objects fulfil the commercial need to make monetary value perceptible and usable for storage and transfer through suitable forms. For this purpose, numerous types of monetary objects have been developed that represent a combination of a currency unit and quantity, among them tangibles and intangibles, such as symbols and records made from shells, gold, paper, and bytes, for example.

Accordingly, article 2 of the Regulation on the introduction of the euro⁴⁸ sets out that the currency name of the participating Member State is the euro, while the currency unit is one euro divided into one hundred cents. The denomination and technical specifications of banknotes are to be defined by the Governing Council of the ECB,⁴⁹ whereas the Council is authorized to lay down these parameters with respect to coins.⁵⁰

The best starting point from which to describe a *single currency* is probably the fact that in a given area, all monetary objects issued by the public sector are expressed in identical units of the same name. Among the Member States participating in the EMU's 'M' (the monetary union), this was achieved by replacing their national currencies with a new currency: the euro. In the long term, however, an alignment limited to the names, currency units, and monetary objects of sovereign issuers would not be sufficient.

Singleness—in the sense in which it is understood here—goes much further. It assumes that the clear majority of the money supply used in a monetary area, including private monetary objects, has the same name(s) and unit(s) of account and that all are exchanged at par. It is unlikely, however, that such singleness across nations will ever emerge and persist naturally. Hence, a single currency also requires a common institutional framework, that is, the adoption of common rules and the designation of common authorities to ensure the aforementioned characteristics of the monetary objects and to foster their widespread use as a means of payment, a store of value, and a unit of account.

4. Properties of ideal monetary objects in particular

There is a set of selected properties that make a monetary object particularly attractive, thus promoting widespread use. If a monetary object includes these properties, the public will automatically use it as money, that is, to pay, save, and calculate. Consequently, all other monies must be oriented towards this optimum to avoid the risk that the public will prefer the ideal money—the latter thus also serving as an anchor.⁵¹

The properties just described make a monetary object particularly suitable to serve both as money for the public and as an anchor for other monies of the same currency. Ideally, in terms of *access*, these properties include smoothness (ie security in balance with effectiveness), inclusivity, and privacy, while in terms of *value*, ideal

48 Regulation (EC) No 974/98 (n 7).

49 Article 128(1) TFEU and article 16 of the Statute. The Governing Council is comprised of the members of the ECB Executive Board and the governors of the NCBs of the Member States whose currency is the euro; see article 283(1) TFEU and article 10 of the Statute.

50 Article 128(2) TFEU and article 11 of Regulation (EC) No 974/98 (n 7).

51 On the question of who should issue ideal monetary objects, see section II.2.b and II.3.a.

monetary objects should be risk-free and uniform (ie circulating at par). Depending on an economy's needs and preferences, more or less auxiliary properties may also exist.⁵²

4.1.1. *In terms of access: secure, efficient, inclusive, and privacy-preserving*

A monetary object's basic function is to make monetary value certain—that is, technically and legally perceptible in a way that is attributable, permanent, authentic, and has integrity (especially fraud resistance). Attributability relates a monetary value unambiguously to the issuer and the holder; permanence makes it reproducible independent of place and time; authenticity proves the issuance by the authorized legal subject; and integrity excludes any unauthorized change (falsification, disposal). At the same time, the smooth use of a monetary object must be guaranteed.⁵³ In other words, efficiency must be optimized in compliance with the security and resilience requirements mentioned above. In particular, it must be ensured that state-of-the-art and innovative technology is used and that the transfer is scalable, instant, final, and as direct as is feasible.⁵⁴

Moreover, an ideal monetary object should be made as inclusive as possible. This implies that it must be cheap and (technically) easy to use without the need for a bank account or specific knowledge and that access is granted to the public at large.⁵⁵ Finally, in a market economy, practically all areas of a society and the lives of its individuals are interwoven with the use of currency. Accordingly, the protection of users' privacy in their dealings with a monetary object is of paramount importance. At the same time, it must be balanced with the need to prevent and sanction money laundering (anti-money laundering (AML)) and the financing of terrorism (countering the financing of terrorism (CFT)). However, research regarding central bank digital currency (CBDC) to date has only occasionally taken account of the fundamental need for privacy.⁵⁶

4.1.2. *In terms of value: risk-free and uniform (circulating at par)*

Regarding their value, ideal monetary objects must have two particular properties: they must be kept as risk-free as possible and must ensure the uniformity of the money.

Freedom from risk Freedom from risk is an essential property of a monetary object because it ensures that a monetary object will be accepted at its face value. It thus fosters the use of a monetary object as a means of payment, a store of value, and a unit of account. Without risk freedom, the market would only accept a monetary object at a

52 See section II.2.c.

53 'Smooth' is used here in an overarching sense, as in ECB, 'The role of the Eurosystem in payment and clearing systems' Monthly Bulletin (April 2002) 47, 48 <<https://www.ecb.europa.eu/pub/pdf/mobu/mb200204en.pdf>> ie requiring a constant balancing between the conflicting characteristics of efficiency and security.

54 Regarding speed and efficiency see eg Crawford, Menand and Ricks (n 4) 130.

55 Stressing the importance of social inclusiveness of cash, see Opinion of Advocate General Pitruzzella, delivered on 29 September 2020 in joined Cases C-422/19 and C-423/19 *Johannes Dietrich and Norbert Häring v Hessischer Rundfunk* ECLI:EU:C:2021:63, Opinion ECLI:EU:C:2020:756, paras 134–139. Crawford, Menand and Ricks (n 4) 125.

56 See Eurosystem, 'Exploring anonymity in central bank digital currencies', *IN FOCUS* No 4 (December 2019) <<https://www.ecb.europa.eu/paym/intro/publications/pdf/ecb.mipinifocus191217.en.pdf>>; ECB, 'Report on a digital euro' (n 1) 27 and below in section II.4.a.

discount, thereby reducing the real value in comparison with the nominal value by the risk premium. This in turn would cause severe frictions because the risk of a monetary object would have to be assessed (or at least its price in the market checked) before each payment, thus making the use of this monetary object less attractive.

However, risk freedom not only provides that a monetary object can be optimally used as a means of payment. Risks are mostly felt in the medium and long term, and therefore, they have a particularly negative impact on a monetary object's store of value function.⁵⁷ However, it shall be recalled that money differs from simple means of payment precisely in that it is likewise suitable for storing value.⁵⁸ As a result, monetary objects that are ideal and thus used as money by the public must be equally suitable for both functions.

Which risks impede risk freedom and how can they be offset? The focus is clearly on minimization of potential inflation (or deflation). To this end, modern monetary authorities are regularly entrusted with the objective of keeping prices stable. According to the definition that the ECB's Governing Council adopted in 1998 and refined in 2003, such price stability is achieved if the year-on-year increase in the Harmonized Index of Consumer Prices (HICP) for the euro area is below but close to 2 per cent in the medium term.⁵⁹ Hence, price stability is the Eurosystem's primary objective when conducting its monetary policy.⁶⁰ In addition, however, the maintenance of price stability is also a supporting task with regard to the optimization of domestic monetary objects because it prevents the ECB and the NCBs from over-issuing monetary objects, thereby improving their risk freedom (in terms of purchasing power risk and exchange rate risk).⁶¹ This shows the complementarity of the two objectives of ideal monetary objects and price stability.

Moreover, the risk of insolvency and illiquidity of the issuer must be mitigated as far as possible. Today, the *monetary objects issued by the state* come closest to this ideal: coins, banknotes, and reserves no longer give their holders the right to demand the delivery of any of the issuer's assets. They have therefore lost their debt claim nature⁶² and with it the associated risk of default. Similarly, the central bank can theoretically issue additional banknotes or reserves at any time—thus marginalizing the liquidity

57 The store of value function is increasingly simply ignored or demonized in recent publications. ECB, 'Report on a digital euro' (n 1) 11, 12 and n 19 being the most recent example, mentioning the store of value function exclusively in a negative sense.

58 If the value storing function is not ensured, this is particularly evidenced domestically by the loss of purchasing power. In an international context, it becomes apparent through depreciation (under flexible exchange rates) or devaluation.

59 See eg Adamski (n 28) para 9.21. Yet, the ECB's President recently pointed out that the hitherto undefined 'medium term' might in future be interpreted more flexibly: Speech at the 'ECB and Its Watchers XXI' conference by Christine Lagarde, 'The monetary policy strategy review' (30 September 2020).

60 This will be discussed in section III.

61 Hofmann (n 22) 53 and n 66.

62 Corinne Zellweger-Gutknecht, 'Developing the Right Regulatory Regime for Cryptocurrencies and other Value Data' in David Fox and Sarah Green (eds), *Cryptocurrencies in Public and Private Law* (OUP 2019) para 4.06ff and 4.12ff (banknotes), 4.22 and 4.27ff (reserves), 4.44 (conclusion); Corinne Zellweger-Gutknecht, 'Negativzins' und Bilanzsituation der SNB aus monetärrechtlicher Sicht' Jusletter (9 February 2015). See now also Michael Kumhof and others, 'Central Bank Money: Liability, Asset, or Equity of the Nation?' Cornell Legal Studies Research Paper (17 November 2020) 20–46.

risk as well. Unsurprisingly, state-issued banknotes circulate at their face value, which distinguishes them from some private banknotes of the past.⁶³

However, most monetary objects today consist of *deposits*. By their nature, deposits are individual private entities' debts. They are backed with the asset side of the issuer's balance sheet, with the latter containing a substantial share of individual credit claims with incongruent maturities, thus entailing liquidity and credit risks. In light of the above, this should reduce the real value of deposits (by causing risk premia when used for payments). Nowadays, however, this is at least significantly reduced by a set of levelling factors, which largely mitigated the risks, at least in times without financial and other crises. In the following paragraphs, we will examine two important groups of levelling factors: prudential and financial.

The first group covers the *prudential* field, which encompasses regulation, authorization, and supervision.⁶⁴ The Union has adopted numerous legislative acts to coordinate and approximate national provisions on banking regulation based on articles 53 and 114 of the Treaty on the Functioning of the European Union (TFEU). Today, the regulatory framework prescribes ratios for liquidity, capital, reserves, and leverage as well as standards for accounting and disclosure. It addresses payment finality, recovery, resolution, supervision, and authorization requirements for credit institutions.⁶⁵ All

63 See eg Gary Gorton, *Misunderstanding Financial Crises: Why don't we see them coming?* (OUP 2012) 13 and 17: not all private USD banknotes were equal in value since they were backed among others with bonds of different states, with the latter having different creditworthiness or even defaulting. Similarly, Swiss private banknotes did not circulate at par until the 1880s (when issuing banks were subject to prudential regulation): Ernst Baltensperger, *Der Schweizer Franken* (2nd edn, Verlag Neue Zürcher Zeitung 2012) 110.

64 On the concepts and objectives of prudential bank regulation, see eg Charles Goodhart, 'Financial regulation' in Sylvester Eijffinger and Donato Masciandaro (eds), *Handbook of central banking* (Edward Elgar Publishers 2011) 328–36. Critical with regard to the latest efforts in the EU to recycle established principles from financial services regulation to regulating crypto-assets and (re-)establishing a playing level field Wolf-Georg Ringe, 'Building a European market for crypto-assets: Who's afraid of Libra?' *Oxford Business Law Blog* (27 October 2020) <<https://www.law.ox.ac.uk/business-law-blog/blog/2020/10/building-european-market-crypto-assets-whos-afraid-libra>>.

65 See eg re LCR: Commission Delegated Regulation (EU) 2015/61 of 10 October 2014 to supplement Regulation (EU) No 575/2013 of the European Parliament and the Council with regard to liquidity coverage requirement for Credit Institutions, [2014] OJ L11/1; capital: Regulation (EU) No 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No 648/2012, [2013] OJ L176/1; reserves: article 19 of the Statute; Regulation (EC) No 2531/98 of 23 November 1998 concerning the application of minimum reserves by the European Central Bank, [1998] OJ L24/1 and Regulation (EC) No 1745/2003 of the European Central Bank of 12 September 2003 on the application of minimum reserves (ECB/2003/9), [2003] OJ L250/10.

these factors are designed to ensure risk freedom in that they minimize the build-up of risks, in order to prevent their materialization or at least to mitigate their consequences on deposits.⁶⁶

The second group comprises various types of *financial assistance*, designed to serve as a last line of defence if risks materialize despite all prudential safeguards.⁶⁷ While a lender of last resort (LoLR) can bridge illiquidity,⁶⁸ (deposit) guarantee schemes take effect in the event of insolvency⁶⁹ or to prevent a bank from entering resolution or insolvency.⁷⁰ However, all these types of aid imply moral hazard, and they ultimately remain imperfect. It is often impossible to decide in time whether an ailing entity is illiquid or (already) insolvent. Therefore, a bank might hope to be kept on a LoLR lifeline even if its economic conduct requires resolution. Moreover, deposit guarantee schemes are insufficient to deal with large, let alone systemic, banking crises.

Uniformity of money Finally, aside from risk freedom, the so-called ‘uniformity’ of money also optimizes monetary objects. Uniformity of money implies that all monetary objects of the same currency circulate at par.⁷¹ This is critical, since it is common for several monetary objects of the same currency—public and private—to coexist within an economic area. They regularly have different issuers, such as commercial banks for

66 In response to the financial crisis, the Union also created the European Banking Authority (EBA) in 2010 and in 2013 expanded the supervisory powers of the ECB based on article 127(6) TFEU to include direct supervision of the largest banks in the Union: Council Regulation (EU) 1093/2010 of the European Parliament and the Council of 24 November 2010 establishing a European Supervisory Authority (European Banking Authority), amending Decision No 716/2009/EC and repealing Commission Decision 2009/78/EC, [2009] OJ L 331/12 (re EBA); Council Regulation (EU) 1024/2013 of 15 October 2013 conferring specific tasks on the European Central Bank concerning policies relating to the prudential supervision of the credit institutions, [2013] OJ L 287/63 (re ECB supervision).

67 At least in the past, states have repeatedly rushed to help systemically relevant banks that were failing. In England, the practice for quite some time until the 1990s was to not let any financial institution fail: Forrest Capie and Geoffrey Wood, ‘The development of the Bank of England’s objectives’ in Peter Conti-Brown and Rosa María Lastra (eds), *Research Handbook on Central Banking* (Edward Elgar Publishing 2018) 34, 46. Proof has yet to be provided that legal prohibitions adopted in response to the bail-outs during the latest financial crisis will be observed in the future.

68 Eg emergency liquidity assistance (ELA) provided by NCBs based on article 14.4 of the Statute in conjunction with the Agreement on emergency liquidity assistance of 17 May 2017.

69 See Directive 2014/49/EU of the European Parliament and of the Council of 16 April 2014 on deposit guarantee schemes (recast), [2014] OJ L 173/149.

70 For a comprehensive overview, see Till Müller-Ibold, ‘State Aid for Financial Institutions’ in Amtenbrink and Herrmann (n 28) para 39.56ff. Besides, in response to the financial crisis, several instruments of aid were established by both the Union and the Member States: Vestert Borger, ‘EU Financial Assistance’ in Amtenbrink and Herrmann (n 28) para 32.1ff. and Ulrich Forsthoff and Jasper Aerts, ‘Financial Assistance to euro Area Members (EFSF and ESM)’ in Amtenbrink and Herrmann (n 28) para 33.1ff. They have since been supplemented with extraordinary monetary policy operations by the ECB, intended to safeguard the monetary policy transmission mechanism, starting in 2009 with the Covered Bond Purchase Programme (CBPP) and ending (to date) in 2020 with the Pandemic Emergency Purchase Programme (PEPP). The side effects of these measures, potentially ranging from moral hazard to the redistribution of wealth via asset price bubbles and negative interest rates, are not yet foreseeable.

71 Hanna Armelius, Carl Andreas Claussen and Scott Hendry, ‘Is central bank currency fundamental to the monetary system?’ (2020) 2 *Sveriges Riksbank Economic Review* 19 <https://www.riksbank.se/globalassets/media/rapporter/pov/artiklar/engelska/2020/200618/2020_2-is-central-bank-currency-fundamental-to-the-monetary-system.pdf> (n 2), 10–12 and 26ff.

deposits, the Member States for coins, and the Eurosystem for tangible banknotes and reserves.

Ideally, all monetary objects would perfectly fulfil the risk freedom requirement, so that the uniformity of money would automatically be ensured. However, this is not the case for deposits, in particular those that contain a default risk of the issuing bank—despite the aforementioned (prudential and financial) levelling factors.⁷² Only by means of a third factor do they actually come close to the ideal of uniformity: monetary systems are usually organized around an *anchor*,⁷³ with the monetary object closest to the aforementioned risk freedom acting as the anchor.

The anchor function emerges when, due to market needs for greater convenience, the most risk-free monetary (but otherwise inconvenient) object is increasingly immobilized, while another, secondary⁷⁴ monetary object of the same currency that consists of a claim⁷⁵ to the immobilized object is circulated instead. Until the last century, for example, gold coins served as an anchor for the lighter and therefore more convenient privately issued banknotes that were to be redeemed in gold. Today, the banknotes of a central bank that are free from the risk of insolvency have taken over the role of anchor. They are, however, circulating less and less, while the digital—and therefore now more convenient—deposits that can be redeemed in such notes are increasingly circulating in our economy.

If secondary monetary objects are fully and immediately convertible into the anchor, they also replicate the store of value and unit of account properties of the anchor. Although such anchors may take many forms, among them a commodity (like gold or silver), nowadays it typically consists of fiat money issued by the central bank—thus well deserving of the name ‘base’ money, in the literal sense. Deposits are secondary monetary objects as just described,⁷⁶ in that their claim nature grants on-demand convertibility into central bank money, thus ensuring parity between deposits and fiat money.⁷⁷ In the public’s perception, the uniformity of different banks’ deposits is assured, because all deposits are convertible into cash at par value. Among the banks, the mechanism is similar: they typically⁷⁸ settle mutual claims (eg arising from a client

72 This is even more true for shadow payment systems, cf only Awrey and Zwieten (n 19) *passim*.

73 Brunnermeier, James and Landau (n 21) 3.

74 For an example of primary and secondary forms of money, see David Fox, ‘Cyber-currencies in private law’ in Shelley Elizabeth Griffiths, Mark Henaghan and Marcelo B Rodriguez Ferrere (eds), *The Search for Certainty: Essays in Honour of John Smillie* (Thomson Reuters New Zealand Limited 2016) <<http://www.nzlii.org/cgi-bin/download.cgi/cgi-bin/download.cgi/download/nz/journals/OtaLawFS/2016/13.pdf>>.

75 Thus, the determination of the anchor is usually based on private law. However, it can also be stipulated by public law and regarding several *public* monetary objects. This was the case, for example, when the 2nd Euro-Regulation declared the pre-existing national currency units to be sub-divisions of the euro; see article 6 of Regulation (EC) No 974/98 (n 7).

76 Not, of course, in terms of transaction frequency and turnover (see n 15), but only in terms of their legal structure.

77 Hans Gersbach and Roger Wattenhofer, ‘A Minting Mold for the eFranc’ CER-ETH Working Paper 20/342 (August 2020) 8 <<https://doi.org/10.3929/ethz-b-000437380>>e Fox (n 74) 134.

78 In 2019, the bulk of payments in TARGET2 were sent to direct participants since the aggregate level of tiering on the sending side reached around 6% (value) and 20% (volume), respectively: ECB, *TARGET Annual Report 2019* (Frankfurt 2020) para 1.13.

payment) using reserves, thereby abolishing the credit risk and removing the liquidity risk.⁷⁹ Hence, what ultimately levels these monetary objects and makes them fungible is the demandability clause and the trust placed in the promise that a deposit will be converted on demand to the liability of another commercial bank or money issued by the central bank.⁸⁰

4.1.3. Potential auxiliary properties such as being legal tender

Finally, auxiliary properties may be implemented to promote a monetary object's use. These traditionally include the sovereign's practice of paying off its own debts in this money, charging and collecting its taxes and other public financial duties in the money it has issued, or imposing the use of a currency for payments between (selected) private parties.⁸¹ The state ratio further increases the amount of money used, while the (tax) debt burden as well as compulsory or default use guarantee a basic demand.

The most significant example of such rules of compulsory or default use of money is the practice of designating an object of money as *legal tender*⁸²—for example, as in the third sentence of article 128(1) TFEU for banknotes.⁸³ Originally, the status of legal tender was primarily a means of securing the demand for the money issued by the sovereign (earning it seigniorage and inflationary gains). This is evident from the fact that the stricter and more punitive the legal tender rules are, the more tense the state's fiscal situation will be.⁸⁴

Today, the legal tender status may still provide some legal certainty in payment transactions as a default standard. However, it is not a mandatory property of ideal monetary objects. This is shown by the very fact that in recent decades, governments

79 See CPMI/IOSCO, *Principles of Financial Market Infrastructures* (April 2012) 7 fn 6; Hanna Armelius and others, 'The rationale for issuing e-krona in the digital era' (2020) 2 *Sveriges Riksbank Economic Review* (Marianne Nessén and Ulf Söderström (eds), *Second special issue on the e-krona*) 6, 9 <<https://www.riksbank.se/globalassets/media/rapporter/pov/engelska/2020/economic-review-2-2020.pdf>>. See also the example in Armelius, Clausen and Hendry (n 71) 27.

80 Speech of Brainard Lael at 'The Future of Money in the Digital Age' Conference, 'Digital Currencies, Stablecoins, and the Evolving Payments Landscape' (Washington DC, 16 October 2016) 3 <<https://www.federalreserve.gov/newsevents/speech/brainard20191016a.htm>>. 3. See also David Andolfatto, *What is Money? How is it Created and Destroyed?* (January 2009) 14 <<http://www.sfu.ca/%7Edandolfa/what%20is%20money.pdf>>.

81 See eg article 4 of Regulation (EC) No 974/98 (n 7): it made the euro the unit of account of the Eurosystem, in particular for monetary policy operations, thus further promoting its use.

82 For a detailed discussion as to whether a digital euro would and should possess legal tender status, see Grünwald, Zellweger-Gutknecht and Geva (n 27), referring to recent case law in the field.

83 It states that the Eurosystem's banknotes shall be 'the only such notes' to have the status of legal tender within the Union. The wording is due to Article 6:114(2) of the Dutch Civil Code of 1992 <<http://www.dutchcivillaw.com/legislation/dccititle6611bb.htm>>, based on which a payment executed through a banking intermediary discharges the relevant monetary obligation. While drafting the treaty, it was (erroneously) thought that this provision made commercial bank money legal tender in the Netherlands—which would no longer be possible (so it was feared at least), if the Eurosystem's euro banknotes were to be declared as the sole legal tender (as was the case in early drafts): Carel C A van den Berg, *The Making of the Statute of the European System of Central Banks, An Application of Checks and Balances* (Dutch University Press 2005) 335, 337.

84 See eg Speech of Andrew Dickson White, *Fiat Money – Inflation in France* (1867, first published 1912, The Ludwig von Mises Institute 2007) 42ff re the French Assignats as an extreme example. See also Arthur Nussbaum, *Money in the Law* (Foundation Press 1939) 40, 45–48, and 53.

have continuously softened their own legal tender rules via exemptions to the advantage of private electronic means of payment, ostensibly to guarantee public safety.⁸⁵ Remarkably, this promotes the use of deposits and thus the money of those issuers who have long since become significantly more important buyers of government debt (including first instance buyers) than central banks.

5. Competencies concerning ideal money

5.1.1. *Market failure as the main reason for state intervention*

In deciding who should be authorized to issue monetary objects, a sovereign ultimately has three options.⁸⁶ First, it can leave it entirely up to the market to create appropriate monetary objects in response to demand and allow these monetary objects to compete against one another. Second, the public sector may claim a monopoly on the issuance of all monetary objects (sovereign money). Under the third option, public and private financial objects may coexist.

This third option is established in market economy practice, including in the EU. The stock in the euro area is composed of both public and private monetary objects. Public monetary objects pertain to monies issued by the public sector, including coins⁸⁷ and banknotes for the public⁸⁸ as well as reserves (ie balances in accounts held with the central bank by selected (financial) market participants).⁸⁹ Private monetary objects mainly include deposits issued by commercial banks and e-money issued by non-bank financial institutions. For the last century at least, tangible banknotes in particular have performed the function of what has hitherto been described as an ideal monetary object, and the same is true for euro banknotes since Stage Three of the EMU.

Before taking a closer look at the statutory division of competences, we will first examine the underlying factual reasons. That is, we will discuss why it should necessarily be a public authority that is tasked with the issuance of ideal monetary objects and why this task cannot be left to the market in general or to commercial banks in particular.

The first reason concerns *network externalities* with regard to the payment function of monetary objects. Nowadays, the latter consist mostly of deposits issued by commercial banks. A dense prudential network has been created over several decades to ensure their stability.⁹⁰ However, these prudential requirements are associated with enormous sunk costs for market entry and lead to cost subadditivity. Because every supplier must bear these costs, the total costs for several suppliers are higher than those for a single supplier. At the same time, suppliers with growing market share benefit from economies of scale and scope—with growth eventually becoming self-reinforcing: the larger a payment community becomes, the more attractive the use of a particular payment

85 A telling example is the case mentioned in n 55.

86 See eg Gersbach and Wattenhofer (n 77) 2ff.

87 Article 128(2) TFEU.

88 Article 128(1) TFEU and article 16 of the Statute.

89 Article 127(4) 4th indent TFEU and article 17 of the Statute. See eg BIS CPMI, Central bank digital currencies (March 2018) 3ff <<https://www.bis.org/cpmi/publ/d174.pdf>>.

90 See section II.2.b.

network also becomes for already existing users.⁹¹ The resulting market concentration leads to natural monopolies (or oligopolies with high sunk costs),⁹² thus preventing new firms from entering the market, stifling innovation, and making it unnecessary for the dominators to internalize social costs and enticing them to charge unjustifiably high fees for their services.⁹³

A second reason relates to deposits' *store of value function*. Because retail users cannot assess and compare the quality of bank balance sheets, they accept equally (low) interest rates independent of the specific bank's risk profile. In addition, retail depositors usually neither require collateral nor withdraw large parts of their holdings at once.⁹⁴ Consequently, again as an undesired externality, banks that take higher risks benefit from the confidence that more conservative banks create with respect to deposits. Conversely, conservative banks may adjust their risks to the interest rate (which might in extremis lead to a so-called 'lemons problem' that describes the phenomenon according to which the quality of a good traded on a market can decrease in the case of information asymmetry between the supply and demand side). This momentum is accelerated by the fact that, as described above, possible financial assistance has created a high potential for moral hazard. Likewise, the introduction of fast payment services will not suffice,⁹⁵ as this only improves the payment landscape but fails to address the public's need for and right to a credit-risk-free store of value.

Finally, the financial market is characterized by genuine *agility*. Therefore, the mechanisms described above cannot be dealt with by regulation alone. Regulatory procedures are too slow and complex, and their outcome is too rigid to fully cover future development. Besides, regulation often has unforeseen adverse side effects and ties up resources into forces for monitoring and enforcement that could otherwise be deployed more productively.⁹⁶

In light of the above, the competence for the issuance of ideal monetary objects intended to serve as money for the public and as an anchor for private monies must be

91 Because growth generates: more income to cover the fixed costs; more netting transactions and related savings; aggregation of data enabling additional cross selling; see John Kiff and others, *A Survey of Research on Retail Central Bank Digital Currency*, IMF Working Papers WP/20/104 (26 June 2020) 11–12 <<https://www.imf.org/~media/Files/Publications/WP/2020/English/wpiea2020104-print-pdf.ashx>>; Mancini-Griffoli and others (n 22) 19.

92 Cross-border payments are a striking example of what happens when the private sector benefits from a monopoly in a monetary area that is not designed to provide a service to peer professionals but to a broad, unorganized mass: payments take days and are expensive, especially for the weakest players: Hofmann (n 22) 40; Mancini-Griffoli and others (n 22) 11.

93 Armelius and others (n 79) 13, defining network effect and externalities on pages 11 and 13.

94 See eg Bank of Canada, 'Contingency Planning for a Central Bank Digital Currency' (25 February 2020) section 4 <<https://www.bankofcanada.ca/2020/02/contingency-planning-central-bank-digital-currency>>; Mancini-Griffoli and others (n 22) 16; Rocco Huang and Lev Ratnovski, 'The dark side of bank wholesale funding' (2011) 20 *Journal of Financial Intermediation* 248, paras 1 and 2.2. See, however, Jan Smets, *Fintech and Central Banks – Fintech and the Future of Retail Banking*, Speech given by the National Bank of Belgium Governor, Brussels (9 December 2016) 9, 10, and n¹³, with reference to opposing views <https://www.suerf.org/docx/l_ec5decca5ed3d6b8079e2e7e7bacc9f2_9467_suerf.pdf>.

95 In this sense, see Mancini-Griffoli and others (n 22) 12.

96 Armelius and others (n 71) 15. In support of antitrust regulations and data protection legislation, see Mancini-Griffoli and others (n 22) 20.

entrusted to a public authority. However, the government and any agency dependent on it would not be appropriate since these bodies pursue fiscal interests in the first place. Rather, all activities safeguarding the best possible quality of money⁹⁷ have to be assigned to an independent public entity.

Making ideal monetary objects available must be one of the entity's primary objectives. The best possible fulfilment of this objective must not serve the entity's own interests or those of any stakeholder, but those of its money's users. In other words, the issuance must be understood as (and exclusively delegated under the principle of) being a *public service* provided in the public interest to ensure the availability of ideal monetary objects as a *public good*. Experience has shown that an independent entity under private or public law (or a mix) endowed by a democratic legal act with an objective in this sense is best placed to fulfil this objective—which is typically the case for modern central banks.⁹⁸ The next section will show that the competences within the Union have been assigned in conformity with these considerations.

5.1.2. *Distribution of competences in the euro zone*

The implementation of Level 1 and Level 2 measures relating to the monetary area—that is, the establishment of EMU and the introduction of a single currency—required the delegation of monetary sovereignty from the Member States to the European Union through the Maastricht Treaty.⁹⁹ At Level 3, both the objective of maintaining price stability and the instrument required to achieve it (ie the definition and implementation of monetary policy) are explicitly provided for in the treaties, including the associated competencies.¹⁰⁰ By contrast, with regard to ideal monetary objects, only the instrument (ie the issuance) is explicitly set out in the treaties while the objective (ie the availability) is not. We will first briefly outline the reason for this before concluding this section with an overview of the distribution of competences relating to the instrument (ie the issuance of cash).

Two reasons were presumably responsible for the fact that the objective of having an ideal monetary object available was not explicitly mentioned in the treaties. First, as we will demonstrate, the representatives of the Member States involved in drafting the treaty directed their full attention toward the division of responsibilities among themselves. Conversely, there was no specific incentive to think thoroughly about state issuance of money as such, since second, due to its long tradition, the state's money issuance was not disputed in principle and therefore required no in-depth justification.

However, as shown above, the availability of state money in all modern monetary jurisdictions is not a random historical remnant. Certainly, fiscal interests may originally have motivated states to become involved in this area. But the fact that they were able to maintain their position as issuers is not due to sovereign powers alone (as a

97 Such activities comprise, in particular, the definition of issuing conditions and the authorization of issuance by all other public bodies.

98 See eg Lastra (n 25) para 7.33, referring to the privilege of note-issue as the central bank's core task. Bossu and others (n 35) 14.

99 Article 3a(2) TEU (Maastricht Treaty).

100 See below section III.

strict state theory of money might lead one to believe). Rather, state money for the public has proven to be an indispensable anchor, to which all private money must be oriented—provided that the state money has the essential properties described above and is therefore actually widely used by the public.

Admittedly, the treaties only mention the instrument (the issuance of money), but not its underlying objective (the availability of ideal monetary objects). Nevertheless, this objective—the public service of making available ideal monetary objects as a public good—has existed for a long time. It was initially the responsibility of each individual NCB. Since Stage Three of the EMU, it has been the responsibility of the ECB, the NCBs, and the Member States. These three players are involved in the issuance of public money (ie the instrument) according to an intricate distribution of competences established in the treaties.

Article 128(1) TFEU gives the ECB exclusive competence to authorize the issue of euro banknotes within the Union¹⁰¹ and empowers the ECB and the NCBs to issue such banknotes.¹⁰² Article 128(2) TFEU provides that the volume of the issue of coins by Member States is also subject to approval by the ECB. Consequently, the ECB was given control over the entire volume of cash supply, or rather, the supply of all public monetary objects intended for use by the public.

Accordingly, the NCBs' competence to issue is merely derivative, subject to the ECB authorization.¹⁰³ Coin issuance remained a competence of the Member States, since it traditionally belonged to the state and coins were deemed to be of minor monetary importance in any case¹⁰⁴—yet again dependent on the ECB's authorization of the quantity.¹⁰⁵ Against this background, the then President of the ECB rightly rejected the Estonian government's request to issue an Estcoin as contrary to article 128 TFEU.¹⁰⁶

Moreover, the second and third sentences of article 128(1) TFEU, in conjunction with article 16.2 of the Statute,¹⁰⁷ reveal that the ECB may authorize other entities

101 Approval is the responsibility of the Governing Council (article 16.1 of the Statute).

102 Article 128(1) 1st sentence TFEU and article 16.1 of the Statute. This includes the allocation of issuance quotas to the NCBs and the ECB. Accordingly, the Governing Council of the ECB has attributed 8% of the issuance to the ECB, which are thus booked in its balance sheet. The distribution key of the remaining 92% reflects the NCB's share in the ECB's capital. Thus, the quotas of *issuance* do not necessarily equal the number of banknotes *put into circulation* commensurate with demand by an NCB in a given Member State. (In fact, the ECB itself does not put any banknotes into circulation.) Since an NCB can put banknotes into circulation even beyond its quota, this creates intra-Eurosystem claims at NCB-NCB and NCB-ECB level. See eg Otto Steiger, 'Which lender of last resort for the Eurosystem?' ZEI Working Paper University Bonn, No B04-23 (September 2004) 14ff <<https://www.econstor.eu/bitstream/10419/39595/1/478943695.pdf>>.

103 See 2nd sentence of article 128(1) TFEU and article 16.1 of the Statute, respectively.

104 See van den Berg (n 83) 333, 338.

105 Article 128(2) TFEU.

106 Rosa María Lastra and Jason Grant Allen, 'Virtual currencies in the Eurosystem: challenges ahead' (July 2018) Monetary Dialogue PE 619.020, 44 <https://www.europarl.europa.eu/cmsdata/150541/DIW_FI_NAL%20publication.pdf> with further references. On the limited competence of Member States to issue coins, prohibiting the latter from issuing a parallel digital currency on the basis of article 128(2) TFEU, see Grünewald, Zellweger-Gutknecht and Geva (n 27).

107 Article 16.2 of the Statute reads as follows: 'The ECB shall respect as far as possible existing practices regarding the issue and design of banknotes.'

(eg commercial banks) to issue banknotes. These banknotes would, however, lack legal tender status.

This wording was chosen to allow for the Governing Council to permit the continuation of UK traditions,¹⁰⁸ had the UK not negotiated an opt-out clause regarding the euro. However, the concession granted in article 16.2 of the Statute does not reach the quality of a competence.¹⁰⁹ Rather, it is a right to request, with the ECB responsible for upholding the request if it is compatible with its policy. Moreover, the scope of article 16.2 of the Statute is relatively marginal: when exercising its competence, the ECB must respect Member State practices. However, the provision clarifies that only existing practices regarding the issue and design of banknotes may be retained and even these only as far as possible—that is, to the extent that the objective of price stability will not be compromised.¹¹⁰

6. A legal and policy evaluation of a digital euro as an ideal monetary object

For over a century, cash—particularly in the form of banknotes—has simultaneously served as money for the public and as an anchor for deposits and other private monies. However, the declining importance of tangible banknotes in an increasingly digitized society means that, beyond a future tipping point, this will no longer be the case. Therefore, tangible cash must be supplemented by a modern, digital equivalent—the digital euro. However, the above applies equally to such a digital equivalent to cash: its issuance cannot be left to market participants. Rather, the ideal possible interplay between public and private actors must be identified without compromising the exclusive liability of the central bank.

6.1.1. *Serving as money for the public*

The unique selling point of digital cash issued by the central bank is first and foremost its almost ideal risk freedom and, more specifically, the absence of insolvency risk. This property has only fully come into play since central bank money has become fiat money.¹¹¹ Similarly, only if a central bank acts as the issuer will digital cash approach the access-related properties described above (ie security, efficiency, inclusiveness, and safeguarding of privacy).

This is due in the first instance to the central banks' mandate, which must be fulfilled in the public's best interest and, second, to the fundamental rights that central banks, as public institutions, must respect. Third and finally, the financial independence granted

108 According to which a hand full of commercial banks in Scotland and Northern Ireland still issue their own banknotes; see van den Berg (n 83) 326, 339–41.

109 According to materials, it is more than a mere '(non-binding) Declaration': van den Berg (n 83) 339.

110 Under these premises, the UK could have requested that the Queen's head be retained on one side of the euro banknotes issued by the Bank of England—the second motive behind Britain's push for the adoption of article 16.2 of the Statute; see van den Berg (n 83) 339.

111 For as long as central bank money was still structured as a claim for a certain collateral, it was possible for any private entity to issue its own banknotes structured in the same way. To prevent this from happening, it was necessary to have a statutory banknote monopoly. Today, that would no longer be necessary; since only central bank money is free of insolvency risk, it already benefits from a natural monopoly in this regard. The question raised by Bossu and others (n 35) 36 as to whether central banks should be granted a monopoly for issuing digital currency (to the public) therefore does not necessarily need a legal answer.

to central banks enables them to fulfil these obligations to the best of their ability. The ECB and NCBs are self-financed from the proceeds of their foreign and monetary reserves and seigniorage and enjoy budgetary autonomy, meaning that, although the law requires an efficient allocation of resources,¹¹² they are not obliged to maximize profits for delivery to the state.¹¹³

In relation to the Eurosystem, this means that the ECB would only issue a digital euro and authorize its issuance by the NCBs if its design and infrastructure were set up such that the digital euro remained on the liabilities side of the issuing central bank's balance sheet and if its security were ensured. Failure in the latter respect—through fraud, hacking, operational deficiency, systemic disruption, or other tail risks—involves enormous social costs. The ECB and NCBs would be obliged to internalize these costs, above all, by taking and funding preventive and contingency measures¹¹⁴ aimed at avoiding or overcoming the realization of such risks. Likewise, the ECB and NCBs would have to opt and pay for an infrastructure and design that allow for the most efficient use possible: a digital euro must discharge debts instantly and with finality, allow convertibility at par with tangible cash, and offer standardized front-end solutions and interoperability with private payment solutions.¹¹⁵ Further, the ECB and NCBs would have to ensure that a digital euro is non-discriminatorily accessible to all segments of the euro area's population, easy to use even for unskilled persons, free of charge for basic services, and generates very low costs for other services, thus supporting financial inclusion.¹¹⁶

A digital euro issued by the ECB and NCBs must also be designed in compliance with users' fundamental rights to privacy as recognized by article 8 of the European Convention for the Protection of Human Rights and Fundamental Freedoms (ECHR), the right to respect for private and family life and the right to the protection of personal data as recognized, respectively, by articles 7 and 8 of the Charter of Fundamental Rights of the European Union,¹¹⁷ and the proportionality principle.¹¹⁸ Any interference with these rights requires justification in accordance with article 52(1) of the Charter: it must

112 See article 127(1) TFEU.

113 For the Eurosystem, see chapter 6 of the Statute and article 282(3) TFEU; Lastra (n 25) paras 2.131 and 7.82–83.

114 See ECB, 'Report on a digital euro' (n 1) 5, 10, 12, 22, 24, 31, 34, 42.

115 See *ibid* 10, 13, 14–15, 20.

116 See *ibid* 3, 9, 10, 12, 15, 20.

117 Charter of Fundamental Rights of the European Union, [2012] OJ C326/391 (hereafter: Charter). Article 7 of the Charter has the same scope of application as article 8 ECHR, even though the wording is different. See article 52(3) of the Charter; Explanatory Note on article 7 of the Charter: Christian Rueckert, 'Cryptocurrencies and fundamental rights' (2019) 5 *Journal of Cybersecurity* 6 <<https://doi.org/10.1093/cybsec/tyz004>>; joined Cases C-92/09 and C-93/09 *Volker und Markus Schecke and Eifert* ECLI:EU:C:2010:662, [2010] ECR I-11063, para 59.

118 See eg recital 33 of Regulation (EU) 2018/1672 of the European Parliament and of the Council of 23 October 2018 on controls on cash entering or leaving the Union and repealing Regulation (EC) No 1889/2005, [2018] OJ L284/6; recital 35 of Regulation (EU) 2015/847 of the European Parliament and of the Council of 20 May 2015 on information accompanying transfers of funds and repealing Regulation (EC) No 1781/2006, [2015] OJ L141/1; recital 51 of Directive (EU) 2018/843 of the European Parliament and of the Council of 30 May 2018 amending Directive (EU) 2015/849 on the prevention of the use of the financial system for the purposes of money laundering or terrorist financing, and amending Directives 2009/138/EC and 2013/36/EU, [2018] OJ L156/43.

be provided for by law and, while respecting the essence of that right and subject to the principle of proportionality, it must be necessary and genuinely meet objectives of general interest recognized by the Union.¹¹⁹ Therefore, a digital euro will have to adequately protect the privacy of the information that is processed in association with its use.¹²⁰ Insofar as data are recorded (eg for authentication purposes), it must be technically ensured that they are either deleted immediately afterwards or used in a privacy-preserving way—only subject to coercive measures against the data subject permitted by court.¹²¹

Conversely, a digital euro issued by market participants would not be credit risk-free from the outset. Moreover, private actors, by their very nature, are generally stakeholder-oriented, self-serving, and profit-making institutions. While not wrong in itself, this has undesirable consequences in the monetary area, owing to a combination of reasons that cannot be effectively contained by policy measures, thus ultimately leading to market failure: in order to make short-term profits, private actors may be tempted not to internalize security-related social costs in advance.¹²² Moreover, their willingness to offer inclusive solutions for non-profitable actors (particularly in the absence of a state ‘competitor’) has also proved to be limited.¹²³ Finally, private business models are increasingly based on the generation of profits from marketable data with relatively poor opt-out options for users.¹²⁴

6.1.2. *Functioning as an anchor*

If a digital euro issued by the ECB and the NCBs were to complement tangible banknotes, it could also support the latter in their anchor function or, as a last resort, could even replace them. This is essential for the uniformity of money for two reasons.¹²⁵ First, depositors get a *sense of control* when, thanks to public money, they are able to withdraw their deposits from a bank whose solvency they doubt.¹²⁶ However, this sense of control extends even further, since, unlike when deposits are withdrawn by transfer, cash-out allows depositors to leave the banking system entirely if they experience

119 See Case C-310/16 *Dzivev et al* [2019] ECLI:EU:C:2019:30 para 36; Case C-419/14 *WebMindLicenses kft v Nemzeti Adó- és Vámhivatal Kiemelt Adó- és Vám Főigazgatóság* ECLI:EU:C:2015:832 paras 71 and 73.

120 See ECB, ‘Report on a digital euro’ (n 1) 8, 12, 24, 28, and n⁴⁷.

121 See re privacy eg Raphael Auer and Rainer Böhme *The technology of retail central bank digital currency*, BIS Quarterly Review, March 2020, 85–100, 93ff; Wierst and Boven (n 5) 33; Bank of Canada (n 94) sections 2–4; ECB and Bank of Japan, *Balancing confidentiality and auditability in a distributed ledger environment* (February 2020) *passim*; Bank of England, ‘Central Bank Digital Currency: Opportunities, Challenges and Design’ Discussion Paper (March 2020) 44 <<https://www.bankofengland.co.uk/-/media/boe/files/paper/2020/central-bank-digital-currency-opportunities-challenges-and-design.pdf>>.

122 See Mancini-Griffoli and others (n 22) 11–12.

123 See at n 92.

124 Rodney Garrat and Maarten RC von Oordt, ‘Privacy as a public good – a case for electronic cash’ Bank of Canada Staff Working Paper 24 (July 2019) 1–3 <<https://www.bankofcanada.ca/wp-content/uploads/2019/07/swp2019-24.pdf>>; Mancini-Griffoli and others (n 22) 11; BIS, ‘Special feature on payments’ (n 121) 95; Wierst and Boven (n 5) 11; Hofmann (n 22) 48, 50, 56 re big tech and data giants.

125 See Wierst and Boven (n 5) 13: ‘If there were no public alternative for the private euro, the value of private money would not be linked to the public euro one-to-one’.

126 See Wierst and Boven (n 5) 14: ‘a euro . . . exchangeable 1:1 for private money . . . bolsters confidence in the monetary system’.

doubt about systemic stability. This option might be used in times of uncertainty, as demonstrated by the fact that after the collapse of Lehman Brothers, the Bundesbank alone issued as many EUR 500 banknotes in a single month as it had in the entire preceding year.¹²⁷

A digital euro would offer the public an alternative course of action. With dwindling cash, this is critical, as even a shift towards euro AAA government bonds would not be equivalent. Only tangible banknotes—or digital euros—are of such a nature that they can be used at any time both to retain value without credit risk and to make payments. As behavioural studies have demonstrated, people's willingness to (continue to) expose themselves to risk increases as they have (or believe that they have) more control over an event.¹²⁸

Second and most importantly, a digital euro would have a *disciplining* effect on banks similar to that which tangible cash has today. Unsustainably managed banks must expect depositors to withdraw their deposits.¹²⁹ Conversely, if depositors—for lack of cash or a substitute—could only make transfers, this preventive effect would be far weaker because depositors then would have no equivalent alternative. Above all, however, deposits would change from a claim nature to a *de facto* fiat money for the public because conversion could no longer be demanded for lack of cash. Different issuers' deposits would enter into competition with one another for the vacant anchor function. This might result in a tendency for the entire banking sector to gradually over-extend credit¹³⁰ in that even poor debtors' credit demand would be met and asset bubbles financed despite the aforementioned prudential regulation.¹³¹ Over time, this would negatively impact the stability of the financial system that is needed for the implementation of monetary policy.¹³²

7. OBJECTIVE: KEEPING PRICES STABLE

This article has proposed that the digital euro may be instrumental in the ECB's achievement of its objective of making ideal monetary objects available. In this section, we address the question of what role the digital euro is to play with a view to the ECB's objective of maintaining price stability.

127 Weidmann (n 12)é 9, 13.

128 See Armelius, Clausen and Hendry (n 71) 29ff.

129 For the last financial crisis, see eg Wierts and Boven (n 5) 13–14.

130 Lastra (n 25) para 2.20; Christoph Herrmann, *Währungshoheit, Währungsverfassung und subjektive Rechte* (Mohr Siebeck 2010) 324ff with further references; Benjamin Klein, 'The Competitive Supply of Money' (1974) *Journal of Money, Credit and Banking* 423, 424 and 426ff.

131 Deutsche Bundesbank, 'The role of banks, non-banks and the central bank in the money creation process' *Monthly Report* (April 2017) 13, 24 <<https://www.bundesbank.de/resource/blob/667334/e0e505ce/f22a8d0bbe8da812f4c634ff/mL/2017-04-monatsbericht-data.pdf>>.

132 See section III.2.a, in which we deviate from Armelius, Clausen and Hendry (n 71) 24, who only address (and rightly deny) the inflationary risk.

8. Objective and instrument to achieve price stability

Today, price stability¹³³ is recognized as an inalienable public good,¹³⁴ and the treaties accordingly assign paramount importance to this objective (article 127(1) TFEU).¹³⁵ The main instrument for achieving stable prices is the definition of monetary policy and its conduct for the Member States whose currency is the euro (article 127(2), first indent, TFEU, mirrored in article 3.1 of the Statute).

For the implementation of monetary policy, a so-called ‘transmission mechanism’ is required, which today is deployed over several stages.¹³⁶ In the beginning, a monetary policy decision is made (eg to help to close a production gap in the real economy). To implement this decision, the ECB modifies the conditions for an appropriate monetary policy operation to be conducted with counterparties accordingly (eg it lowers the repo rate). Such adjustments ultimately increase or decrease the counterparties’ reserves¹³⁷ and thus indirectly influence the conditions under which they lend and borrow money in financial markets.¹³⁸ This passes through to changes in the interest rates and prices of financial market assets. Ultimately, via a range of further transmission channels (eg the bank deposit and lending rate, but also the real interest rate, expectations, etc), the financial market’s movements pass through to the real economy. In our simplified example, it should ease the conditions for financing for additional production in order to meet the demand that would otherwise have led to an undesired price increase.¹³⁹

9. Supporting tasks

However, not all obligations incumbent on the Member States and the Union, which are ultimately indispensable for achieving price stability, qualify as instruments themselves. For instance, this is the case with the duties to secure sound public finances and a sustainable balance of payments:¹⁴⁰ they merely serve as supporting preconditions in this context. As mentioned in the Introduction, the creation of such conditions is neither an objective nor an instrument in itself but is merely a prerequisite for the proper implementation of an instrument (here: monetary policy) and the achievement of an objective (here: price stability).

133 On the term as such, see n 59.

134 Armelius and others (n 79) 8.

135 Lastra (n 25) para 7.28. Re definition see Klaus Tuori, ‘Monetary Policy (Objectives and Instruments)’ in Amtenbrink and Herrmann (n 28) para 22.7ff.

136 ECB, ‘The Implementation of Monetary Policy in the Euro Area’ (September 2006) 7ff <<https://www.ecb.europa.eu/pub/pdf/other/gendoc2006en.pdf>>.

137 See also section III.2.c.

138 Wierds and Boven (n 5) 20.

139 See eg Tuori (n 135) figure 22.3; Jack Meaning and others, ‘Broadening narrow money’ Bank of England Staff Working Paper No 724 (18 May 2018) 15 <<https://www.bankofengland.co.uk/-/media/boe/files/working-paper/2018/broadening-narrow-money-monetary-policy-with-a-central-bank-digital-currency.pdf?la=en&hash=26851CF9F5C49C9CDBA95561581EF8B4A8AFFFA52>>.

140 Article 119(3). See article 136(1)(a) re budgetary discipline as well as articles 126 and 139(4)(b) re government deficits.

The same is true for the supporting elements mentioned in article 127 TFEU that are essential to the implementation of monetary policy to guarantee stable prices—in particular, an institutional framework,¹⁴¹ stable counterparties in a stable market, a single currency, and an effective payment infrastructure. They are each a prerequisite for the implementation of successful monetary policy. Their essential characteristics are outlined below, and the associated competencies are subsequently described.¹⁴²

9.1.1. *Contributing to stable counterparties in a stable market*

The central bank needs counterparties with whom it can enter into contractual operations and who will propagate the impulses thus created within the framework of a free market economy. Today, banks assume a cardinal role as counterparties in the transmission of monetary policy.¹⁴³ In addition, related operations on the wider financial market are also of increasing importance. In any case, the monetary policy transmission mechanism requires both financially sound credit institutions and an overall stable financial market. This is clearly reflected in the changing role of central banks, whose mandate is increasingly expanded towards financial stability.¹⁴⁴

9.1.2. *Preserving a single currency*

A currency in which the monetary value of all kinds of economic goods and services can ultimately be expressed is required. To this end, the currency is also used in operations with the counterparties, as outlined above.¹⁴⁵ However, monetary policy presupposes a single currency, which must exhibit the elements identified in section II of this article: a name and unit(s) of account as well as monetary objects (one of which serves as base money to the public and as an anchor for private monies). This is because the need to manage several currencies simultaneously would severely impede monetary policy. An example of this was provided by the market when it began to price the bonds of various euro-Member States as though they were Deutschmark-euro, drachma-euro, etc in 2010.

9.1.3. *Promoting a payment infrastructure*

The final essential precondition in support of monetary policy to be addressed here are effective dissemination media—above all ideal monetary objects and an effective

141 The institutional framework is vital to ensure legal certainty in terms of responsibilities, objectives, tools, tasks and rules: Antonio Sáinz de Vicuña, 'An Institutional Theory of Money' in Mario Giovanoli and Devos Diego (eds), *International Monetary and Financial Law* (OUP 2010). See also Lastra (n 25) para 2.101. The treaties, above all the Statute, and the legislative powers delegated therein, are geared to this end. A more detailed description is not necessary at this point for the purpose pursued here.

142 See section III.3.

143 Hofmann (n 22) 52; ECB, 'The Implementation of Monetary Policy in the Euro Area' (n 136) 11; ECB, 'The role of banks in the monetary policy transmission mechanism' Monthly Bulletin (August 2008) 85–98.

144 See section III.3.

145 See at the end of section III.1.

payment infrastructure.¹⁴⁶ By itself, the issuance of central bank money would be futile. Only if the management of circulation is likewise ensured can the monetary objects fulfil their intended functions—that is, to serve as money and anchor in the case of cash and as a settlement and monetary policy prerequisite in the case of reserves.¹⁴⁷

However, smooth operation does not merely require infrastructure. Ultimately, smoothness can only be optimally achieved if central bank money is used as a means of payment to avoid operational, credit, and liquidity risks related to private monies and the frictional costs that they incur. For this reason, today's monetary policy operations are conducted via balances in reserve accounts held by commercial banks with their central bank.¹⁴⁸ We would not go as far as to say that therefore 'reserves are also a monetary policy tool'.¹⁴⁹ Rather, the actual tool is the terms and conditions under which the central bank concludes operations with its counterparties (ie the commercial banks), thereby increasing or reducing (sterilizing) reserves or remunerating them.¹⁵⁰ Even if reserves are charged negative interest rates, only the latter serve as a tool, while the reserves themselves remain a mere—though essential—dissemination medium like the infrastructure itself.¹⁵¹

10. Competencies concerning price stability

The maintenance of price stability is the Eurosystem's primary objective (article 127(1) TFEU).¹⁵² While the Member States and the Union must likewise ensure compliance with the principle of stable prices (article 119(3) TFEU), the primary responsibility clearly lies with the Eurosystem.¹⁵³ This is evidenced by the fact that, on the basis of article 3(1)(c) TFEU, the Union has delegated to the Eurosystem the main instrument for achieving the price stability objective—monetary policy—or rather its definition¹⁵⁴ and conduct for the Member States whose currency is the euro (article 127(2) first indent, TFEU, mirrored in article 3.1 of the Statute).

146 See above all Phoebus Athanassiou, 'Payment Systems' in Amtenbrink and Herrmann (n 28) 711–735; ECB, *The Payment System: Payments, Securities and Derivatives, and the Role of the Eurosystem* (ECB 2010) <<https://www.ecb.europa.eu/pub/pdf/other/paymentsystem201009en.pdf>>; ECB, 'The role of the Eurosystem in payment and clearing systems' (n 53) *passim*.

147 Both cash and reserves require their own kind of payment infrastructure. In relation to cash, the infrastructure requirement is not to be understood primarily as a technical but rather as an organizational task. As far as reserves are concerned, the Eurosystem has implemented TARGET2, the backbone of the infrastructure facilitating wholesale payments in euro, and, since November 2018, TARGET instant payment settlement service (TIPS). See Athanassiou (n 146) para 24.27–35; ECB, 'The role of the Eurosystem in payment and clearing systems' (n 53) 55–56.

148 See eg BIS CPMI (n 89) 3ff.

149 Armelius and others (n 79) 9.

150 See section III.2 and in detail ECB, 'The Implementation of Monetary Policy in the Euro Area' (n 136) 14–33.

151 Christian Waldhoff, 'Comments on Article 127' in Helmut Siekmann (ed), *EWU Kommentar zur Europäischen Währungsunion* (Mohr Siebeck 2013) para 57 derives the supporting role (side task; *Nebenauftrag*) from the fact that the ESCB has the right to delegate the role of an actor.

152 See also article 282(2) TFEU and article 2 of the Statute.

153 See n 37.

154 See section II.2.b.

In addition, the Eurosystem is entrusted with the supporting tasks just mentioned.¹⁵⁵ Not being instruments in themselves, their fulfilment is nevertheless a prerequisite for the effective conduct of monetary policy. This refers in particular to the ‘basic tasks’ set out in article 127(2), second indent, and 128 TFEU. Yet, it also includes the contributions to the prudential supervision of credit institutions and the stability of the financial system required by article 127(5) TFEU.

In principle, ensuring *stable financial markets* is a core objective for other institutions. Nonetheless, the Eurosystem’s contributory responsibility and competence in this regard is due to the fact that policy transmission is dependent on a stable financial market and market participants suitable to serve as counterparties in central banks’ monetary policy operations. Consequently, the Eurosystem’s financial stability measures must be conducive to maintaining price stability and should not go beyond what is needed to achieve this objective.¹⁵⁶

By the same token, while the issuance of banknotes as set out in article 128(1) TFEU is another basic task for the objective of making *ideal monetary objects* available, it is merely a supporting task with regard to the objective of maintaining price stability. As a supporting task, it aims at creating an environment in which monetary policy can best unfold its effects. For instance, the anchor function ensures the uniformity of money and thus the creation of a single currency through which monetary policy can be transmitted with as little friction as possible. Hence the complementarity between these two operational objectives and their respective instruments and preconditions: just as the stability of the currency is an indispensable prerequisite for the singleness of a currency,¹⁵⁷ a single currency is presupposed in order for monetary policy to keep prices stable effectively. In conclusion, the Eurosystem’s banknote issuance prepares the ground for an effective monetary policy.

To support effective monetary policy transmission, the fourth indent of article 127(2) TFEU, as mirrored in article 3.1 of the Statute, further requires that the Eurosystem promote the smooth operation of payment systems.¹⁵⁸ Article 22 of the Statute sets out that the Eurosystem may¹⁵⁹ provide facilities and regulations to ensure efficient

155 See section III.2.

156 Michael Ioannidis, ‘The European Central Bank’ in Amtenbrink and Herrmann (n 28) 353. See also Rosa Maria Lastra and Georgios Psaroudakis, ‘Prudential Supervisory Tasks’ in Amtenbrink and Herrmann (n 28) 751–84, para 26.82, suggesting that monetary policy should pursue price stability, whereas (macro-)prudential supervision rooted in article 127(6) should be directed at financial stability only. The difficulties arising from the delegation of two different tasks (involving different degrees of independence, judicial review, etc) to one institution are only just beginning to emerge.

157 See section II.2.b.

158 The Eurosystem considers itself to assume complementary roles to fulfil its task: operative as owner and operator of or participant in a system; monitoring as overseer of systems; and enabling as facilitator and catalyst: Athanassiou (n 146) paras 24.26–45; ECB, *The Payment System* (n 146) 243–308; ECB, ‘Revised Oversight Framework for Retail Payment Systems’ (ECB 2016) <https://www.ecb.europa.eu/press/pr/pdf/other/Revised_oversight_framework_for_retail_payment_systems.pdf>; Case T-496/11 *United Kingdom of Great Britain and Northern Ireland v ECB* ECLI:EU:T:2015:133 para 4. To this must be added the shaping role of the regulator, which permeates and strengthens the aforementioned roles.

159 Thus, the Eurosystem is not obliged to operate such systems itself. It is sufficient to promote them: Waldhoff (n 151) para 57.

and sound clearing¹⁶⁰ and payment systems within the Union and with other countries. Article 34.1 of the Statute empowers the Eurosystem to adopt regulations,¹⁶¹ take decisions, make recommendations, and deliver opinions. Hence, the Eurosystem enjoys a wide and powerful range of tools to fulfil its infrastructure-related task.¹⁶² However, due to its supporting nature, these competences as well as the instruments-related powers granted by article 18 of the Statute (relating to the monetary operations) and article 20 of the Statute (concerning other instruments of monetary control) only extend as far as they serve to fulfil the Eurosystem's monetary policy tasks and operations.

Finally, the competence to issue reserves arises from article 17 of the Statute and lies with both the ECB and the NCBs. In contrast to the cash provisions in article 128(1) and (2) TFEU, the ECB was not given the competence to authorize the issue of reserves by the NCBs. Hence, there is only an indirect control by the ECB. However, this is not inconsistent with the price stability objective, since reserves are generally used for settlement purposes and seldom to purchase goods that are relevant to the HICP.

11. A legal and policy evaluation of a digital euro to maintain price stability

The preceding sections highlighted that euro prices are kept stable by monetary policy, but that an effective monetary policy requires certain preconditions. These preconditions are dependent on a stable financial system,¹⁶³ a single currency,¹⁶⁴ and appropriate dissemination media such as a functioning payments infrastructure and reserves, for optimal transmission of monetary policy impulses.¹⁶⁵ In the following, we explain that in light of the decline of cash, a complement in the form of a digital euro will be required to ensure the continued transmission of monetary policy (section III.4.a). We also identify two further functions that a digital euro might perform in the context of monetary policy: improving the supply of information to the central bank (section III.4.b) and becoming a medium of monetary policy transmission itself (section III.4.c). We argue, however, that the use of the digital euro as a new policy transmission medium is not legally permitted.

11.1.1. Safeguarding the monetary policy transmission mechanism

The well-established monetary policy transmission mechanism of the Eurosystem can only be preserved if the public continues to make extensive use of monetary objects in the euro, such as banknotes and deposits. In this regard, a digital euro could maintain

160 However, this is limited to payment clearing systems alone, providing eg net settlement payment: Case T-496/11 *United Kingdom of Great Britain and Northern Ireland v ECB* ECLI:EU:T:2015:133, paras 89–101.

161 Legal acts of general application, binding in their entirety and directly applicable in all Member States (participating in the euro area); see ECB, 'The role of the Eurosystem in payment and clearing systems' (n 53) 50.

162 See ECB, *The Payment System* (n 146) 309–27.

163 See section III.2.a. As an anchor, banknotes on the one hand discipline commercial banks (thereby improving their stability) while on the other hand they reassure clients (thereby reducing the risk of premature bank-runs); see also section II.4.b.

164 See section III.2.b.

165 See section III.2.c.

this status quo by preventing migration out of the currency,¹⁶⁶ particularly if the use of euro banknotes declines.¹⁶⁷ If, instead, private euro monetary objects alone had to cope with this task, the disappearance of the anchor would weaken these monies' quality as well as the stability of the issuing entities in the medium term.¹⁶⁸

Monetary policy would be impaired if prices and wages were quoted increasingly in *non-domestic* currencies due to the growing use of foreign or private (digital) monetary objects. For instance, where foreign currency is widely used, prices and wages would remain relatively unaffected if the Eurosystem were to try to influence the exchange rate to accommodate monetary conditions in times of adverse macroeconomic shock.¹⁶⁹

Besides, it is particularly questionable whether parity could be maintained between deposits and central bank money with only clearing and settlement in reserves.¹⁷⁰ Even if the view that it could were to prevail, however, it would be too short-sighted: an effective monetary policy requires sufficient transactions with reserves (reserve turnover) and a real economy that quotes the bulk of its prices and wages in local currency. Reserve turnover is needed because the central bank steers the condition of its provision and sterilization by transacting with its counterparties, the commercial banks.¹⁷¹ This amounts to an attempt at pushing a rope, metaphorically speaking, if monetary policy counterparties neither demand new nor use their existing reserves. However, this precise situation could arise if the public were to make fewer and fewer payments in euro. In that case, not only would the demand for bank loans in euro decline, but so would all interbank customer payments, thus reducing the banks' need for clearing and settlement euro reserves. Even prudential liquidity requirements could not stabilize the quantum of reserves required, as the latter is based on the expected future outflow of deposits (again depending on the demand for euro). In brief, a digital euro would prevent such a reserve turnover collapse.

To avoid both such scenarios, the public in the euro area should be provided with a digital euro that is sufficiently attractive, as outlined above,¹⁷² to prevent or reduce the public's switch towards funds other than euro. Therefore, the digital euro should be designed in a cash-like manner with no variable features—that is, as a so-called 'autonomous factor'. As in the case of tangible banknotes, the amount issued would

166 See ECB, 'Report on a digital euro' (n 1) 11ff re a scenario in which a form of foreign money of central banks, commercial banks or e-money institutes becomes a credible alternative money in the euro area.

167 See section II.4.a. See also Christoph Keller, 'Comments before Article 17–24' in Siekmann (n 151) para 16 (translated): 'the banknote monopoly [is] one of the main pillars of the demand for central bank money and thus for the operational business of central banks.' However, see n 111 against the necessity of a monopoly.

168 See section II.2.b and II.4.b. Hofmann (n 22) 58ff dissents, considering regulatory promotion of the convenience of deposits to be sufficient.

169 Armelius and others (n 79) 13 give a corresponding example for Sweden.

170 In this sense, eg Wierts and Boven (n 5) 13: 'This channel [i.e. the exchange of commercial banks' claims on other banks for balances in the reserve accounts with the central bank] does not depend on the use of cash by the general public and continues to exist even if general purpose CBDC is not introduced'. See our arguments against this view in section II.2.b and II.4.b.

171 See in detail ECB, 'The Implementation of Monetary Policy in the Euro Area' (n 136) 14–33.

172 See section II.4.a.

not be controlled by the ECB but would be based on public demand.¹⁷³ Designed in this way, the digital euro would help safeguard the monetary policy transmission mechanism without altering the mechanism itself.

11.1.2. *Improving the provision of information to the monetary policy authority*

Depending on its design, a digital euro—or rather, digital euro transactions—could serve as an additional source of information for the central bank. As such, it could help maintain or even enhance the Eurosystem's ability to collect financial data in real time.¹⁷⁴ However, this could be at most an auxiliary reason for the introduction of a digital euro. Moreover, the possible advantages of such a design might be outbalanced by considerable risks.¹⁷⁵ Therefore, we will not investigate this option further in the present article.

11.1.3. *Becoming a medium of monetary policy transmission itself*

In theory, a digital euro could also be used as a medium that disseminates its own monetary policy impulses. To this end, it should be designed to have variable features. The most important variable feature would be the possibility to pay or collect interest on digital euro holdings. Another obvious possibility would be the introduction of limits on such holdings—whether limits per person, per transaction, or overall, and as an alternative to or in combination with interest. This would allow the central bank to influence the public demand,¹⁷⁶ for example, via an interest rate charged or paid. Several economists and legal scholars would welcome a digital euro designed in this way,¹⁷⁷ as it could significantly broaden the central bank's policy options—both in terms of the policy rate and the monetary aggregate itself.

Proponents justify such an opinion as follows: an interest-bearing digital euro might make monetary policy more effective through improved pass-through of policy rate changes, influencing the conditions under which liquidity is available.¹⁷⁸ This is because, if the central bank raises both its policy rate and interest rates on a digital euro,

173 Marianne Nessén, Peter Sellin and Per Asberg Sommar, 'The implications of an e-krona for the Riksbank's operational framework for implementing monetary policy' (2018) 3 *Sveriges Riksbank Economic Review* 29 and 32–34.

174 Mario Bergara and Jorge Ponce, 'Central Bank Digital Currency: The Uruguayan E-Peso Case' in Gnan Ernest and Masciandro Donato (eds), *Do we Need Central Bank Currency?* (Société Universitaire Européenne de Recherches Financières 2018) 82, 90: 'with e-Peso monetary policy analysis will dispose of granular information in real time, which is not available with tangible cash. This should improve the efficiency of day-to-day monetary operation'; Kiff and others (n 91) 11 with further reference: 'CBDC could . . . tap more granular payment flow data to enhance macroeconomic projections.'

175 Kiff and others (n 91) 13–14.

176 Nessén, Sellin and Asberg Sommar (n 173) 29–42, 34.

177 See eg Agarwal Ruchir and Kimball Miles, 'Breaking through the Zero Lower Bound' IMF Working Paper WP/15/224 (2015) <<https://www.imf.org/en/Publications/WP/Issues/2016/12/31/Breaking-Through-the-Zero-Lower-Bound-43358>>. With regard to a digital dollar see eg Robert Hockett, 'Money's Past is Fintech's Future: Wildcat Crypto, the Digital Dollar, and Citizen Central Banking' (2019) 2(2) *Stanford Journal of Blockchain Law and Policy* 221.

178 See eg Hanna Armelius and others, 'The e-krona and the macroeconomy' (2018) 3 *Sveriges Riksbank Economic Review* 43, 52; Meaning and others (n 139) 25.

banks would also be forced to raise interest rates¹⁷⁹ if they wish to prevent their clients from converting deposits into digital euros.¹⁸⁰ By the same token, a negative interest-bearing digital euro could potentially help remove the effective lower bound (ELB)¹⁸¹ constraint—although only if cash were simultaneously abolished or made costly.¹⁸² Moreover, it is feared that the ELB would climb to close to zero if a digital euro were interest-free, since monetary policy counterparties might then opt to hold digital euros rather than reserves.¹⁸³ Thus, the Eurosystem could no longer apply negative interest rates (discussed below) as part of its monetary policy.¹⁸⁴

A digital euro would also enable the public sector to make swift and direct payments to the public, thereby increasing available liquidity without having to resort to interest rate policy. Such payments could either be made by the government and thus paid out of tax revenues and other public funds or distributed for free by the Eurosystem members. Their purpose may vary, including, for instance, aggregate demand stimulus or the provision of emergency cash to distressed households and businesses to relieve hardship caused by extraordinary events or even a built-in expiration date to spur spending.¹⁸⁵

As tempting as these new options may appear at first glance, they do not outweigh the numerous disadvantages and concerns associated with a euro with variable features. Some of these are general and others are directed specifically against negative interest rates, while yet others refer specifically to the extraordinary injection of money.

To begin with, it is ‘not clear that the pass-through of the policy rate needs strengthening’ at all.¹⁸⁶ Moreover, it would not be compatible with a *free market* economy for the central bank to impose interest rates as a sovereign act. For this reason, central banks use open market operations and standing facilities to fix interest rates, with counterparties free to enter or not enter into contracts. Therefore, it would be equally objectionable to attempt to achieve this effect through indirect means, such as by authoritatively setting

179 Better service could outweigh a (small) part of the interest.

180 Nessén, Peter and Asberg Sommar (n 173) 35.

181 The ELB describes the floor for nominal interest rates. It lies several decimal points below zero, as it corresponds to the costs incurred through holding non-interest-bearing cash (instead of reserves), including expenses for storage, insurance, transport, etc; Nessén, Peter and Asberg Sommar (n 173) 36; Hossein Nabilou, *Central Bank Digital Currencies: Preliminary Legal Observations*, Working Paper 2019, 11 <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3329993>.

182 Kiff and others (n 91) 13; Rogoff Kenneth, ‘Costs and Benefits to Phasing Out Paper Currency’ NBER Working Paper 20126, National Bureau of Economic Research, Cambridge MA (2014) *passim* <<https://www.nber.org/papers/w20126.pdf>>; Michael D Bordo and Andrew Levin, ‘Digital Cash: Principles and Practical Steps’ National Bureau of Economic Research Working Paper No 25455 (2019) <https://www.hoover.org/sites/default/files/research/docs/19101_bordo_levin.pdf>. See also Ben S Bernanke, ‘How big a problem is the zero lower bound on interest rate?’ Hutchins Center on Fiscal & Monetary Policy at Brookings (12 April 2017). However, see Tyler Cowen, ‘Did the zero lower bound matter?’ *Marginal Revolution* (14 May 2019) <<https://perma.cc/B26S-VEVG>> with further reference.

183 Nessén and others (n 173) 35.

184 Nessén and others (n 173) 36–37.

185 See eg David Chaum, Christian Grothoff and Thomas Moser, ‘How to issue a central bank digital currency’ SNB Working Papers 2021-03, 16.

186 BIS CPMI (n 89) 10.

an interest rate for a digital euro, which would then force commercial banks to adjust their interest rates accordingly.

Further, negative interest rates are tantamount to *taxation*, at least in economic terms.¹⁸⁷ The rule that any tax must have a firm basis in law was not pertinent up to now, as negative rates were only directly applied to monetary policy counterparties based on contractual agreements on the open market or within the framework of facilities that the banks use on their own initiative. However, such an exemption is unlikely to be available when digital euros are issued to fulfil a public task.

Moreover, it does not matter whether only fewer goods can be acquired with a certain quantity of money due to rising prices, or whether fewer goods can be acquired because *negative interest* rates have reduced the quantity of money in question.¹⁸⁸ Besides, almost 10 years after the introduction of negative interest rates,¹⁸⁹ the associated negative side effects are becoming increasingly tangible, gradually altering the role of central banks and ultimately impeding their independence.¹⁹⁰ At the same time, scholars without ties to central banks have yet to provide robust evidence of the net positive effects of low interest rates. A negative interest-bearing digital euro might also violate the principle of proportionality. The envisaged objective of preventing monetary policy counterparties from circumventing the central bank's interest rate policy could be achieved by milder means—namely, by either prohibiting counterparties from holding digital euros (whether as legal or beneficial owners) or applying the reserve rate to their digital euro holdings. Since all counterparties are regulated institutions, this measure would be enforceable. Finally, the introduction of a digital euro carrying a negative interest rate may provoke public resentment, making its introduction politically inexpedient.¹⁹¹

12. CONCLUSION

This article has reached two key conclusions. First, based on article 128(1) TFEU, the ECB and the NCBs of the Eurosystem are already *de lege lata* both authorized and obliged to issue a digital euro in the form of a digital equivalent and complement to

187 Rogoff (n 181) 1: The idea of 'taxing currency' in this way is attributed to Silvio Gesell, *Die Natuerliche Wirtschaftsordnung* (Rudolf Zitzmann Verlag 1916), available in English as *The Natural Economic Order* (Peter Owen Ltd 1958); see also Willem H Buiters, 'Negative Nominal Interest Rates: Three Ways to Overcome the Zero Lower Bound' NBER Working Paper 15118 (June 2009).

188 The origin of the price stability mandate, that is debasement of coinage, should not be forgotten. It was initially addressed by transferring the issuance of money to independent bodies that did not reduce the fineness of the coin for fiscal purposes. With the transition to fiat money, a new instrument was needed instead of the standard of the coinage (*Münzfuss* in the sense of a fixed amount of precious metal in a coin: the price stability mandate). In addition, negative interest rates on a digital euro would have to be weighed against the right to property as enshrined in article 17(1) of the Charter (n 117).

189 See Corinne Zellweger-Gutknecht, 'Negativzins: Vergütung für die Übernahme des Geldwertrisikos durch den Kapitalnehmer' (2015) *Zeitschrift für die gesamte Privatrechtswissenschaft* 350, 362ff.

190 Among these are the risk that governments will further postpone necessary consolidation and reform efforts due to a loose fiscal policy framework; conflict of interest of central banks of deeply indebted states; eroding margins of banks and pension funds; lenders financing unsustainable or overly risky projects and borrowers; overvaluation of safe haven currencies leading to distortion in the export sector, including tourism, or prompting central banks to balloon their balance sheet.

191 Nabilou (n 182) 12 with further references.

tangible cash. Second, the treaties include no authorization to use such digital euro as a medium of monetary policy transmission itself. In particular, the digital euro must not be interest-bearing.

Regarding the first conclusion, empowerment and obligation to issue money is based on the ECB's and NCBs' key objective of ensuring the availability of *ideal monetary objects*—public and private. Ideal money is as risk-free (thus circulating at face value) and uniform (ie circulating at par with other monies of the same currency) as possible in terms of value as well as secure, efficient, privacy protecting, and inclusive in terms of access. Such money, particularly if it is to be credit risk-free, cannot be created by market participants. Rather, it must be issued by a public body that is independent of the treasury, ensures price stability (to minimize the risk of inflation), and enjoys budgetary autonomy. The availability of ideal monetary objects for the public thus proves to be a public service that must be provided in the public interest. Money issuance under article 128(1) TFEU is the instrument with which this objective is achieved.

This does not prevent private money, above all deposits, from being issued, but instead promotes coexistence. Owing to the ideality of the public money, private monies are also designed as ideally as possible because private issuers must maintain the quality of their private money at such a level that the public does not want to hold mostly public money. Until the digital era, tangible banknotes fulfilled this function as ideal money for the public and anchor for private monies.

However, with society's advancing digitalization and the growing AML hurdles, traditional banknotes are increasingly losing their convenience. Hence, the decline in the use of cash by no means suggests that the issuance of tangible cash pursuant to article 128 TFEU is becoming obsolete. Rather, it is an indication that the ECB and the NCBs no longer entirely fulfil the objective of ensuring the availability of ideal monetary objects by issuing tangible cash alone. A new, additional monetary object is needed: a digital euro. Only with a digital euro in combination with tangible cash will the economy of the euro area, which is in the midst of a transition from the analogue to the digital age, again have ideal monetary objects at its disposal.

If article 128(1) TFEU were to be interpreted narrowly (ie limited to tangible banknotes), the ECB would be unable to counteract the decline in demand for domestic public money, and its mandate to issue banknotes would be deprived of meaning. This cannot have been the intention and will of the treaty drafters. Consequently, article 128(1) TFEU must be interpreted in a broader sense as both empowering and obliging the ECB to authorize the issuance of a digital euro as just described.

The second conclusion is that the use of a digital euro as a *monetary transmission medium* is impermissible under the current constitutional framework. The issuance of cash to the public on the basis of article 128 TFEU is not part of the instrument of monetary policy as mentioned in article 127(2), first indent, TFEU. Nothing to the contrary can be derived from articles 17 and 22 of the Statute: like articles 18 and 20, article 17 of the Statute is aimed at regulating the circumstances under which Eurosystem members conduct their monetary policy operations with selected counterparties. Even if the circle of 'market participants' were to be extended, the term chosen by the treaty drafters is clearly aimed at business actors and was never intended to cover the

public at large. Nor can it be argued that the Eurosystem's task of providing facilities under article 22 of the Statute may include the establishment of an infrastructure for the issuance, processing, and settlement of a digital euro. Unlike monetary policy and note-issue, this cannot be an end in itself. On the contrary, only insofar as it is necessary either for monetary policy or for the issuance of money may article 22 of the Statute be invoked.¹⁹²

The only, yet still essential, roles that a digital euro plays in terms of monetary policy under the current constitutional framework are to safeguard the existing monetary transmission mechanisms and potentially to improve the supply of information to the Eurosystem. The existing transmission mechanisms require stable counterparties in a stable market, a single currency, and effective media for disseminating monetary policy impulses—above all, reserves and payment infrastructures. The issuance of a digital euro as an ideal form of public money creates indispensable preconditions for these requirements: with its anchor function, it ensures the singleness of the currency and has a disciplinary and thus stabilizing effect on the banks, which are the most essential counterparties in monetary policy operations.

With that said, cash—whether tangible or digital—must not be directly used for monetary policy. A digital euro may only serve as a complement to existing banknotes to ensure the availability of ideal monetary objects for the public.

This, of course, presupposes that a digital euro would have properties that are at the technological frontier and in line with best practices and the current state of the art. However, the public sector is not known for innovation. It is therefore essential that the provision of all non-core services related to a digital euro be left to (supervised) private entities. They could, for example, authenticate end users and deal with AML- and CFT-related activities, provide technical connectivity between users and the Eurosystem's infrastructure, execute digital euro transactions on behalf of their customers, and offer storage facilities for digital euro holdings.¹⁹³ On the one hand, this could leverage existing customer-facing services and avoid the costly duplication of processes. On the other hand, competition among these entities would drive technical innovation, allowing the Eurosystem to implement prevailing solutions.

Given the strong network externalities associated with payment systems, the Eurosystem should assume an operative role by providing a core infrastructure on which private entities might establish these additional services. This would help to reconcile competing policy objectives: it would mitigate the market dominance of private payment systems and reduce the concentration risk, while creating a level playing field upon which the private sector could further innovate its own monies and services to the public.

192 For Bossu and others (n 35) 15 it seems sufficient for a central bank to be entrusted with the operation and oversight of payment systems as such. In contrast (and in agreement with the European Court of Justice, see n 160), however, we consider this to be a mere prerequisite and not an independent mandate.

193 See ECB, 'Report on a digital euro' (n 1) 13, 21, 22, 37.