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Riflessioni con
Vincenzo Zeno-Zencovich

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a cura di

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36. B. CORTESE (a cura di), *Il diritto dei beni culturali. Atti del Convegno OGIPAC in memoria di Paolo Giorgio Ferri. Roma 27 maggio 2021*, 2021
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38. V. BONTEMPI (a cura di), *Lo Stato digitale nel piano di ripresa e resilienza*, 2022
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41. J.M. PERIS RIERA, A. MASSARO, *Derecho Penal, Inteligencia Artificial y Neurociencias. Diritto Penale, Intelligenza Artificiale e Neuroscienze*, 2023
42. A.D. DE SANTIS, *La disapplicazione dell'atto amministrativo nel processo civile. Premesse per uno studio*, 2023
43. F. RUGGERI, *Poteri privati e mercati digitali. Modalità di esercizio e strumenti di controllo*, 2023
44. E. RIGO (a cura di), *Per una ragione artificiale. In dialogo con Lorenzo d'Avack su Costituzione, ordine giuridico e biodiritto*, 2023
45. C. SALVI, *Cinquant'anni di scritti giuridici*, 2024
46. D. CHINNI, L. PACE (a cura di), *Il Referendum abrogativo dopo la tornata del 2022. Nuove tendenze e nodi irrisolti*, 2024
47. V. ZENO-ZENCOVICH, *Il futuro dell'Accademia. Scritti dedicati agli allievi*, 2024
48. F. APERIO BELLA, A. CARBONE, E. ZAMPETTI (a cura di), *Dialoghi di diritto amministrativo. Lavori del laboratorio di diritto Amministrativo 2022-2023*, 2024
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50. G. FIORELLI, E. FRONZA, N. GUZMÁN, D. IPPOLITO, L. MARAFIOTI (a cura di), *Verità e giustizia nel processo penale. Atti del convegno di studi giuridici organizzato dalle Università di Bologna, Buenos Aires e Roma Tre (18-22 gennaio 2024)*, 2025
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Noah Vardi

*Money as a legal construct: the contribution of a comparative interdisciplinary approach in framing monetary phenomena*¹

SUMMARY: 1. Money and the law – 2. Money as a legal construct: a functional perspective between mandatory rules and private autonomy – 3. Money as a social and cultural construct: the case of complementary currencies – 4. Money as a technological construct: virtual currencies and Central Bank Digital Currencies – 5. Conclusive remarks.

1. *Money and the law*

Studies on ‘money and the law’ are a pillar in social studies just as ‘money’ is a pillar of social organization and development of community life. It is therefore not surprising that money has been analyzed as a construct under multiple branches of science and that it is not confined to the realm of economics, with which it is often *prima facie* associated.

Comparative legal studies have gained, and can gain, precious insight from such interdisciplinary approaches to the analysis of social phenomena, and it is therefore with this set of lens that one would here like to share a few reflections on the role of money as a legal, social, and technological construct, in an attempt to humbly follow the tracks that have been set by eminent Scholars. These observations aim at pointing out how the legal construct of money (in terms both of scholarly debate and in terms of legislative activity) has increasingly yielded to societal, cultural and technological constructions. Even though the monopoly of the State in the legal construction of money remains an unmovable tenet, there are signs of a gradual erosion in practice, accelerated especially by digital innovation. The starting point for these notes is therefore a historical approach to the legal construct of money. Following are a few observations on the societal

¹ This essay is offered in honor of Professor Vincenzo Zeno-Zencovich with deep gratitude and admiration. The choice of this topic is both a tribute to his numerous studies on the subject, but also to the many discussions on these themes entertained over the years, beginning with my research as a doctoral student many years ago.-

and cultural aspect tied to the monetary phenomenon and a final reflection on the disruption of digital technology and its impact on the way in which money is constructed and perceived.

2. Money as a legal construct: a functional perspective between mandatory rules and private autonomy

A building block often posed in the first pages of well-known and foundational studies of money and the law, is the one containing definitions of 'money' from a legal- and functional- perspective. The stress on the 'legal' aspect of money is not a mere question of form or an attempt to fit the monetary phenomenon within legal schemes (and dogma). Rather, the comparison between the common definitions of money from a functional (economic) perspective and the common definitions of 'money in the law' are the first sign of how the same social construct, which can perform the functions that society expects it to fulfill, is accordingly tailored, sometimes only with minor variations, to comply with language and institutes of different branches.

It may be useful to therefore begin by recalling these well-known functional definitions of the monetary phenomenon in economics and in law, and to later examine the changes in functionality when analyzed as a social phenomenon from a cultural perspective, or as a technological phenomenon, viewed under the lens of innovation. Providing a definition of money from a legal perspective is far from being a straightforward task, and this notwithstanding the fact that money is a central concept in law, which is more often than not considered as an acquired notion².

² Arthur Nussbaum recalls a well-known anecdote that took place during a debate at the House of Commons at the beginning of the 19th Century on whether the metallic standard should be restored or not: a witness, called to define «a pound» to which he had previously referred, answered «*I find it difficult to explain it, but every gentleman in England knows it. It is something that has existed without variation in this country for eight hundred years- three hundred years before the introduction of gold*» [40 Hansard, *Parliamentary Debates* 679 (1819)]. (A. NUSSBAUM, *Money in the Law*, The Foundation Press, Chicago 1939, p.14).

Very few legal systems provide a general definition of money; an interesting exception is the one contained in the US Uniform Commercial Code § 1-201 (24) which defines money as «a medium of exchange currently authorized or adopted by a domestic or foreign government. The term includes a monetary unit of account established by an intergovernmental organization or by agreement between two or more countries» where

This acquired notion of ‘money’ is incorporated both into general rules of law (suffice it to think of the underlying idea of a ‘price’ at the basis of economic transactions) but also disciplined by very specific and sectorial rules (the entire legislation surrounding currency for example).

Starting from the economic blueprint, used by many legal scholars in the attempt to frame money under a legal perspective, money is traditionally defined as a medium of exchange, a measure of value, and a store of wealth (that serves as a reserve of liquidity)³. Whilst mostly recognizing that legal definitions of money reflect certain economic considerations, well-known scholarship has warned that the legal point of view focuses on different aspects when compared with the functional economic definition⁴, and has subsequently defined money as «chattels, which are issued under the authority of the law in force within the State of issue, are denominated with reference to a unit of account, and are to serve as the universal means of exchange in the State of issue»⁵. Other approaches highlight the functional identity underlying the ‘economic’ and ‘legal’ definitions of money⁶, moving from the former and translating it into the latter⁷ mostly as ‘means of payment’, ‘unit of account’ and ‘store of value’. Along similar lines, more pragmatic perspectives underline the sterility of the debate on what constitutes money, and rather focus on the notion of ‘payment’, that

the focus on the concept of monetary sovereignty is noteworthy.

³ See *ex plurimis*, G. CROWTHER, *An Outline of Money*, Rev. Ed., Thomas Nelson & Sons, London- Edinburgh- Paris- Melbourne- Toronto-New York 1955, p.20, posing special emphasis on the notion of medium of exchange and defining money as «*anything* that is *generally acceptable* as a means of exchange (i.e. as a means of settling debts)» (italics in original).

This functional definition of money has been criticized under a sociological perspective (on which *infra*) since it is based on a «misleading implication that the functions explain the existence and nature of money» (G. INGHAM, *The Nature of Money*, Polity- Wiley & Sons, Cambridge 2004, p.5).

Legal scholars have tried to approach the problem of defining money in different ways, with numerous theories that it is impossible to recall in these brief notes. Reference will accordingly be made to some of most notorious constructs, that have set the terms of subsequent scholarly debate.

⁴ F.A. MANN, *The Legal Aspect of Money: With Special Reference to Comparative Private and Public International Law*, 5th Ed., Oxford University Press, Oxford 1992, p.5.

⁵ *Id.*, p.8.

⁶ E. QUADRI, *Le obbligazioni pecuniarie*, in *Trattato di diritto private*, Dir. da Rescigno, vol. IX, 2nd Ed., UTET, Torino 1999, p.525.

⁷ See B. INZITARI, *La moneta*, in *Trattato di diritto commerciale e di diritto pubblico dell'economia* Dir. da Galgano, vol. VI, CEDAM, Padova, 1983, p.4; J. CARBONNIER, *Droit civil*, 3, *Les biens*, 19th Ed., Presses Universitaires de France, Paris 2000, p.48.

is central in commercial transactions⁸.

What is clear for a legal observer of the phenomenon, is that money is taken into account in private law (with or without legislative definitions) principally when it is the object of a transaction (i.e. a monetary obligation): this very circumstance attracts the transaction into a realm of special rules (on performance, delay, tender) that may or may not find their own legislative and dogmatic category, but that invariably constitute a special discipline when compared to other transactions involving a tender of chattels or performance⁹.

Setting aside for the scope of these observations a wider analysis of the problems arising from the application of general rules tied to property, possession, circulation of chattels, performance of obligations when money is involved, suffice it to note that special rules are necessary because of the prevailing aspect of the function that money fulfills, over the physical (or virtual) nature of tokens used. Indeed, the definition of money as an abstract 'ideal unit', that is completely dematerialized and unconvertible ever since the end of metallism, highlights the prevalence of function over form in an exemplary way¹⁰.

A first observation is that this consideration is further supported by

⁸ R. GOODE, *Commercial Law*, 3rd Ed., Butterworths Law, London 2004, p.452. The latter distinction between money and payment reinforces the idea that economists and lawyers conceive money in a different way: whereas for example a bank deposit may be considered as money from a functional point of view for an economist, the lawyer may not consider it as such and will rather tend to focus on private rights and on the problem of legal discharge of monetary obligations (i.e. on 'payment'). See C. PROCTOR, *Mann on the Legal Aspect of Money*, 6th Ed., Oxford University Press, Oxford 2005, p.11. For this distinction see the pioneering work of L. VON MISES, *Theories des Geldes und der Umlaufsmittel*, Verlag von Duncker & Humblot, München – Leipzig 1924, pgs.44-45). Further characteristics tied to the payment function, are that in order for a commodity to be recognized as a means of payment it should have the characteristics of scarcity (actual or controlled), countability, uniformity, durability, portability and broad acceptance. See C. HERRMANN, C. DORNACHER, *International and European Monetary Law : An Introduction*, Springer, Cham 2017, p.2.

⁹ Comparative overviews show that whether or not obligations to pay a sum of money are theorized within a general category of 'monetary obligations' (e.g. the German and Italian construct) or rather disciplined within specific contractual schemes (e.g. loans), the rules on performance, the principle of nominalism, the production of interests on a sum of money, are present in most Western legal systems.

¹⁰ The reference is of course to the theory of the 'ideal unit' famously illustrated by Arthur Nussbaum, according to which «Money, the concrete object, is thus a thing which, irrespective of its composition, is by common usage treated as a fraction, integer or multiple of an ideal unit» (NUSSBAUM, *Money in the Law*, cit. p.5 and ff.). See also INZITARI, *La moneta*, cit. p.11.

comparative analysis. On the one hand *fiat* money is inherently dependent on monetary sovereignty (which may or may not be national, as the case of the euro emblematically shows) and thus supported by the national (or supranational) rules on the basis of which that sovereignty is legitimized¹¹. One could accordingly expect a flourishing of different rules for monetary transactions tailored on national policies, at least in the domain of private law.

On the one hand certain divergences between legal systems –of the Eurozone for example– can still be found as concerns the notion of legal tender¹², to the extent that the EU has adopted a proposal for a Legal Tender Regulation complementing the proposal for the adoption of a Digital euro¹³. On the other hand, it is quite easy to identify recurring rules, even if not adopted universally, in the discipline of monetary obligations, including tenets such as the nominalistic principle, or the legal the production of interests over a sum of money, or specific rules in case of delay or non-performance –just to quote a few.

Comparative analysis also highlights common patterns of jurisprudence where the ordered monetary situation is impacted or disrupted by external events (notoriously monetary crises, hyperinflationary cycles, depreciation

¹¹ It is worth noting that monetary sovereignty and the monetary monopoly of the State have been questioned in recent years due both to «voluntary surrender» (represented by the European Monetary Union for example), but also «due to limitations caused by globalization, information technology and economic and financial developments in the past decades» (HERRMANN, DORNACHER, *International and European Monetary Law*, cit., p.14).

¹² See the Results of the 2009 Report of the Euro Legal Tender Expert Group (ELTEG) on the definition, scope and effects of legal tender of euro banknotes and coins (p. 3 and ff. and Annex, pgs.23-43), indicating the absence of a common concept and definition of legal tender, as well as differences in the nature of the norm attributing legal tender and the process through which legal tender can be acquired and/or lost. As highlighted by Vincenzo Zeno-Zencovich, at least in the Eurozone, not all legal systems recognize the following characteristics «a) The obligation to receive a payment in currency having legal tender in the legal system that governs the obligation, unless the parties have previously agreed on different methods; b) The nominalistic principle, according to which the payment due corresponds to the face value indicated by the currency- in coins/banknotes – having legal tender; c) The discharging nature of the exact payment in legal tender currency with the consequence of extinguishing the obligation.» V. ZENO-ZENCOVICH, *Digital Euro as a platform and its private law implications*, in A. Palmieri, G. Versaci (Eds.), *European Legal Strategies for payment systems in the Open Banking Age*, Edizioni Scientifiche Italiane, Napoli 2023, p.198.

¹³ Proposal for a Regulation of the European Parliament and of the Council on the legal tender of euro banknotes and coins (COM (2023) 364 final), on which see *infra*.

of the currency¹⁴)—at least pending *ad hoc* legislative interventions to counter extraordinary conjunctures¹⁵. One can also notice a certain convergence of the evolution generated by practice and judicial interpretation which have broadened the panoply of instruments considered equated to ‘money’ (i.e. as a means for lawful discharge of a debt) in performing payments¹⁶.

With reference to the payment function, this has been further confirmed at least as regards European law, by the efforts of the European legislator in creating harmonized rules for payments (i.e. the Payment Services Directives¹⁷, the creation of the Single European Payments Area and so forth). It is not difficult to read in these observations a recognition of the importance of the ‘payment’ function of money, which as authoritatively highlighted is the principal function of money under a commercial law perspective; therefore within the different economic and legal functions of money identified periodically, it is also intuitively the one most easily

¹⁴ Reference is of course to the well-known cases on monetary obligations decided by national courts between and in the aftermath of the two World Wars, that used (or developed) notions such as the *Wegfall der Geschäftsgrundlage*, the principle of good faith, the *théorie de l'imprévision*, the doctrine of frustration and the doctrine of impracticability, in attempts to alleviate the performance of long term payment obligations radically transformed by exceptional and unforeseen monetary devaluation and inflation.

¹⁵ It is interesting to note, once again with reference to the problem of legal tender, the results of the 2009 ELTEG Report (p.6) highlighting on the one hand the role of ‘good faith’ as a justification for the refusal of payment in legal tender in certain exceptional cases, and on the other the role of contractual freedom as a possible limit to legal tender provisions. Results that are still confirmed in the 2022 Final Report of the ELTEG III, where divergences between Member States as to whether retailers can legally refuse cash payments are still recorded, «pointing to the complex relationship between legal tender and contractual freedom» (Final report of the Euro Legal Tender Expert Group (ELTEG) of 6 July 2022, p.3)

¹⁶ This is especially true for those European systems (e.g. Italy, Portugal, Spain, Poland, and France) that have codified the principle that only payment in currency discharges an obligation but have interpreted these norms in an evolutionary way so as to include for example the transfer of scriptural money. On Italian law see for example A. SCIARRONE ALIBRANDI, *L'interpretazione della banca nell'adempimento dell'obbligazione pecuniaria*, Giuffrè, Milano 1997, p.23 and ff.; p.190 and ff.; V. SANTORO, *L'efficacia solutoria dei pagamenti tramite intermediari*, in G. Carriero, V. Santoro (Eds.) *Il diritto del sistema dei pagamenti*, Giuffrè, Milano 2005, p.65 ff and p.69; B. INZITARI, *L'adempimento dell'obbligazione pecuniaria nella società contemporanea: tramonto della carta moneta e attribuzione pecuniaria per trasferimento della moneta scritturale*, in *Banca, borsa e titoli di credito*, LXX, Iss. 2, 2007, 133, p.137 ff.

¹⁷ Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market (PSD II), in *OJ L* 337, 23.12.2015, p.35, which repealed the so-called PSD I (Directive 2007/64/EC).

subject to harmonization efforts.

This leads to a second consideration. Whereas one would tend to identify the discipline of money within the framework of private transactions as the realm of private autonomy, there is in reality a strong prevalence of mandatory norms (from the principle of nominalism, that has been considered a principle of ‘public order’ and that cannot always be waived through monetary clauses and indexation, to the principle of mandatory acceptance of currency having legal tender and the consequent discharge from a payment obligation that it carries). The relevance of the role of the State as a ‘seal’ on what constitutes money is not surprisingly evident in some of the legal definitions of money recalled above.

This is also true –somewhat more intuitively– if one considers the way in which money is disciplined under a perspective of public law. Here legislative rules are mostly instrumental to the implementation of monetary policy. This is notoriously supported by State theories of money¹⁸, that imply not only the exclusive power to attribute the character of official currency to a chattel regardless of its intrinsic value, but also entail the exercise of monetary sovereignty, under the form of controls over exchange with foreign currencies, implementation of monetary policies, adoption of a new currency, abrogation of gold standards and so on. Practice however suggests that there are two areas in which a gradual erosion of the monopoly of the State over what is accepted as money –at least socially– has emerged.

The first is as old as the development of money itself: usages of commerce. An accepted use of a payment instrument as an equivalent to payment in currency expands the category of what is considered money even without the official stamp of the State¹⁹. Rules developed within commerce, originally as *lex mercatoria* and then also adopted by non-merchants, historically strengthened the role of banks as the principle intermediaries in commercial and financial transactions. Within this role indeed, banks became central in creating, backing, and circulating payment instruments, initially for the mercantile transactions, later for generalized use; the evolution finally reached the point where these instruments have been endorsed by the State itself and even legislatively imposed where traceability of payments is desirable or necessary for

¹⁸ Famously expressed by Georg Friedrich Knapp (G.F. KNAPP, *Staatliche Theorie des Geldes*, Duncker & Humblot, Leipzig 1905 (and following editions)).

¹⁹ This includes bank money: suffice it to recall for example that the ECB considers currency circulation *and* overnight deposits within the so-called “narrow money” (M1) monetary aggregate (emphasis added).

the implementation of its policies (most notably today for anti-money-laundering, counterterrorism and fiscal tracking policies).

In this a central role has been played by technological developments, which have increasingly provided instruments for the cashless transfer of money, with an impressive acceleration from initial wire transfers between banks to the current digital instruments for retail payments that citizens carry in their pockets²⁰.

This includes the case of electronic money, first disciplined by EU Directive 2000/46²¹ later repealed by Directive 2009/110²² which was introduced with scope of providing an electronic version of banknotes and coins (stored on an electronic payment device or stored remotely and managed through a specific account, and issued by banks or electronic money institutions on receipt of funds), whilst remaining, however, a form of scriptural money (“stored monetary value as represented by a claim on the issuer which is issued on receipt of funds”)²³.

²⁰ Vincenzo Zeno-Zencovich already noted almost twenty years ago how notwithstanding the anticipations of a move towards a cashless society date back to the 1970’s, the process is still far from being completed and furthermore, the gradual substitution of cash with scriptural money (whose acceptance falls within the realm of contractual autonomy) has not affected the legal monopoly of the State over money. See V. ZENO-ZENCOVICH, *Temi e problemi economico-giuridici della moneta elettronica*, in S. Sica, P. Stanzone, V. Zeno-Zencovich (Eds.), *La moneta elettronica*, Giuffrè, Milano 2006, p.16.

²¹ Directive 2000/46/EC of the European Parliament and of the Council of 18 September 2000 on the taking up, pursuit of and prudential supervision of the business of electronic money institutions, in *OJ L275*, 27/10/2000, p.39

²² Directive 2009/110/EC of the European Parliament and of the Council of 16 September 2009 on the taking up, pursuit and prudential supervision of the business of electronic money institutions, in *OJ L 267*, 10/10/2009, p.7

²³ E-money is now being officially incorporated in the law of payments of the EU, with the new discipline contained in the third Payment Systems Directive (PSD III) and Payment Systems Regulation proposals (Proposal for a Directive of the European Parliament and of the Council on payment services and electronic money services in the Internal Market of 28.6.2023 (COM (2023) 366 final) and Proposal for a Regulation of the European Parliament and of the Council on payment services in the internal market of 28.6.2023 (COM (2023) 367 final) (as well as into some provisions of the Markets in crypto-assets Regulation (MiCA) (on which see *infra*)).

3. *Money as a social and cultural construct: the case of complementary currencies*

A second area which has seen a social (and principally cultural) erosion of the monopoly of the State is tied to the development of alternative forms of money that are not intermediated (or not necessarily intermediated) by banks and other financial institutions and that ideally are meant to perform two out of three of the recognized functions of money, namely means of payment and unit of account.

This development falls under so-called societal theories of money, which focus on the social aspect of trust both towards the public entity and towards the private counterparties within transactions. These constructions demonstrate how it is the community that determines whether or not there is a sufficient element of trustworthiness in accepting chattels or tokens, other than legal tender, as 'money'. The theoretical premise is that the mandatory norms on what constitutes money should not be interpreted as being exclusive, with the societal aspect sometimes prevailing over the legal aspect; the 'societal aspect' of money being indeed an additional perspective, alongside the legal one, through which monetary phenomena can be read²⁴.

There are numerous historical examples in which alongside legal tender, alternative means of payment have circulated (and historically it is- with the risk of oversimplification- the fear of the competition of these alternative monies to the monetary prerogatives of the Sovereign that has supported the creation (or reinforcement) of imperial/national monetary systems, (often based on the principle of an intrinsic value of money (i.e. metallism))²⁵. Even without going too far back in history, well-known

²⁴ Sociological theories of course provide different definitions of money, including the notion that money is not a thing but a process, capable of change over time; it can be considered as a social relation between creditors and debtors («a socially (including politically) constructed promise» according to Geoffrey Ingham's (2004) definition). This notion adopts a different perspective both from the view that considers money only as serving economic functions, and from the view that considers money only from a cultural perspective. See L. SARTORI, *The Social Life of Sardex and Liberex*, in *Partecipazione e Conflitto* Vol. 13, Iss. 1, 2020, 487, p.489, and the literature cited therein.

For an economic- sociological approach to money and more specifically to circuits such as the ones created through complementary local currency systems, see Viviana Zelizer's work and in particular *The Social Meaning of Money*, Basic Books, New York 1994; and V. ZELIZER, *Circuits in economic life*, in *Economic Sociology- MPIfG*, Vol.8, Iss.1, 2006, p.30.

²⁵ See the detailed historical reconstruction by Tullio Ascarelli, who moving from the Middle Ages recalls the theories of the *moneta imaginaria* and of the intrinsic value of the means of measurement and highlights how the formation of centralized monarchies in

cases of ‘alternative money’, like food stamps or other fungible tokens used as money, to set ‘prices’ on black markets during wartime, are found in those economic cycles in which there is either no trust in the official currency (volatility, political turmoil, relative weakness of one currency as compared to another, wartime embargos on goods or foreign currencies), or the currency has lost its purchase power (cases of hyperinflation, of devaluation, of depreciation).

Whereas these are recurring hypotheses mostly driven by emergencies and crises, there is another set of hypotheses that find their origin in voluntary experiments backed by social and economic theories and that aim at furthering specific scopes. It is in these cases that one can think of money as a ‘social’ and political –often openly manifested– construct; close-knit communities or larger geographical regions, which choose to adopt a local ‘alternative’ currency to the official one, in order to support local economy (often in moments of crisis, or in attempts to counter certain effects of globalization processes, or to encourage sustainable development goals or economic and financial inclusion)²⁶.

Amongst numerous examples, one can recall ‘complementary’ or ‘convertible local currencies’²⁷ such as the Bristol Pound project which functioned from 2012 to 2021 in the city of Bristol²⁸, and the ongoing

the XVIth Century leads to a reaffirmation of the monopoly of central power in minting coins and will be the prelude to the nominalistic principle (T. ASCARELLI, *Obbligazioni Pecuniarie*, in A. Scialoja- G. Branca (Eds.), *Commentario del codice civile. Libro quarto-delle obbligazioni*, Zanichelli, Bologna-Roma 1959, p. 26 and ff.).

²⁶ As noted by sociological and economic literature, experiments in Western countries in the late XXth Century have acquired stability over time, have involved diverse social groups (from the economically marginal to the countercultural) and have lost their ‘emergency character’, while this is still present in experiences of the global South, which also tend to interest weaker social strata. See SARTORI, *The Social Life of Sardex and Liberex*, cit., p.490.

²⁷ Convertible local currencies (CLCs) are backed by national fiat money at a 1-to-1 ratio, and they circulate within a defined locality where they can be spent with local businesses that agree to accept them. See A.P. MARSHALL, D.W. O’NEILL, *The Bristol Pound: A Tool for Localisation?*, in *Ecological Economics*, vol. 146, 2018, p. 273 and ff.

Some legal systems have expressly regulated complementary local currencies; the French Monetary and Financial Code as amended in 2014 contains provisions on these unofficial currencies that can only be used within a geographical region and that must comply with certain principles of social economy and solidarity (in line with the objectives that often underlie these initiatives) (see art. L 311-5 *Code monétaire et financier*).

²⁸ The Bristol Pound (UK’s largest convertible local currency during its time of operation) was launched in 2012, in both digital and cash forms, with the scope of localizing trade and «building community wealth by trapping money in the local economy» and it

Sardex project born in Sardinia, now operating in different Italian regions²⁹. Whereas the Bristol Pound project can qualify as an alternative money, used as a means of payment, the characteristics of the Sardex project combine a payment function with a mutual credit system (and a closer analysis of the operating scheme suggests that it may be functionally equated to a form of scriptural money, with all the relevant considerations regarding its discharge value³⁰).

The two initiatives have faced different fates and respond to different schemes from a legal point of view³¹. There are however some recurring

operated until 2021. It was then followed by the Bristol Pay project, a non-profit closed loop payment platform, with the scope of diverting the sums that leave the city in digital payment charges to support local initiatives, but the project did not raise enough funds and the Bristol Pound CIC was closed in 2023 <<https://www.bristolpoundlegacy.info>>. The Project was managed by the Bristol Pound Community Interest Company and the Bristol Credit Union, which ensured the backing of the conversion from Sterling to Bristol Pounds, and was supported by the local City Council (which accepted payments of municipal taxes in the local currency).

²⁹ The Sardex project is different from the Bristol Pound Project in that it also integrates a form of credit intermediation. The Sardex Project, qualified as a «Circuit of Commercial Credit» and initially managed by Sardex s.r.l., later Sardex S.p.A., was officially born in 2009 with the scope of connecting small businesses in a local territory by providing payment instruments and credit that are «parallel and complementary to the traditional ones»: once a business is admitted to the circuit, with a prior evaluation (defined by some as a sort of ‘creditworthiness assessment’) of the value of the goods and services that it can bring into the circuit, it pays a fee and it is granted a credit in ‘Sardex’ money (with a floor for negative and a top for positive balances). This can be then used to exchange its goods or services with those of the other participants in the circuit, up to the value of the credit. The scheme (according to which the debts resulting from the exchange are virtually cleared in an account in ‘Sardex’ held by the managing society) seems to fall into the category of a barter, with an atypical plurilateral contract in which parties exchange goods and services that are cleared by the barter company (see G.L. GRECO, *Valute virtuali e valute complementari, tra sviluppo tecnologico e incertezze regolamentari*, in *Rivista di diritto bancario*, Iss. 1, 2019, 61, p. 87). The ‘Sardex’ money is qualified by the Project as a unit of account, with a nominal value that is at par with the euro and in no case the credit in ‘Sardex’ units on the single accounts can be converted into fiat currency or into securities before an agreed due date. (See SARTORI, *The Social Life of Sardex and Liberex*, cit., pgs.493-494).

³⁰ GRECO, *Valute virtuali e valute complementari, tra sviluppo tecnologico e incertezze regolamentari*, cit., pgs.90-91, offering a wide reconstruction of the project’s features.

³¹ Indeed ‘complementary currencies’ can comprise various models that respond to different economic functions, including so-called ‘backed currencies’ (which are backed by the official currency having legal tender and are fully convertible) and ‘mutual credit currencies’ (in which the complementary currencies are the units of account that are used for the exchange within the circuit and that are ‘centrally’ cleared by the issuing

characteristics that can be observed, and that indicate a growing awareness regarding the potential of creating parallel ‘monetary systems’ to the official one of the State— with which the relation is not in terms of opposition— whilst maintaining all the instruments provided by legal currency (first and foremost, a nominal at par value which excludes that these instruments bear any form of interest nor any speculative *ratio*).

As intuitive, the role of community-based trust is the pivot around which these initiatives are built³². Their foundation is a voluntary adherence to a scheme and thus they are grounded in private autonomy, which clarifies why the projects are not interested in attributing the qualification of official legal tender to the complementary currencies, not even within a limited territory (and which is also clearly the condition for these alternative monies not to incur in the opposition of the State, which detains the exclusionary power over monetary functions).

If one were to analyze these alternative currencies under the functional perspective of money, as highlighted earlier these projects are conceived first of all —and at a minimum— as means of payment; furthermore, if considered as the unit against which goods and services are exchanged within the circuits, they also function as units of account (and measure of value).

The question regarding the third function, the one of the store of value, is more complex. On the one hand, many local alternative currencies are construed around a model known as ‘depreciative currencies’, (based on the theory of ‘accelerated money’, in which money loses value on a predetermined scale³³) with the scope of encouraging the spending of the

organization). (See M. AMATO, L. FANTACCI, *Moneta complementare*, Mondadori, Milano-Torino 2013). There are of course several other models of complementary currencies, which a study in 2013 has mapped and grouped into four categories: service credits (i.e. Time Dollars/time banks), mutual exchange schemes, local currencies and barter markets (G. SEYFANG, N. LONGHURST, *Growing green money? Mapping community currencies for sustainable development in Ecological Economics* vol. 86, 2013, 65, p.69 and ff.). See also L. GIACHI, F. PROIA, F. TUZI, *Le monete complementari. Pratiche economiche e legislazione regionale*, in *Cambio. Rivista sulle trasformazioni sociali*, Vol. 11, 2021, Iss. 21, p.13 for a more recent overview of Italian schemes of complementary currencies.

³² The approach of different local communities to the same identical scheme of an alternative currency (in this case with the further function of mutual credit) can however show quite different motivations: research conducted on the social dimension of the two projects of the Sardex and the Liberex (the latter a subsequent filiation with the same scheme of the former, but located in the region of Emilia-Romagna) interestingly highlights substantial differences in the way in which trust is perceived and in the way in which the community interacts with the initiative, as well as in the motivations to join the circuit in the first place. See SARTORI, *The Social Life of Sardex and Liberex*, cit., pgs.495-507.

³³ Theory elaborated by Silvio Gesell in his book *The Natural Economic Order* (1st English

money (to boost local demand) and discouraging any form of hoarding; this is the case of many regional currencies in Germany for example³⁴.

Other schemes exclude that the balance held in the local currency can be converted before a set deadline (e.g. the Sardex model). Finally, as mentioned previously, these schemes are usually pegged onto the national legal tenders at a one to one par value, excluding any form of volatility in the exchange and also excluding that they bear any form of interest. The combination of these characteristics indicate that these forms of alternative currencies are not conceived as stores of value nor as potential investment instruments. One could add that this is true at an individual level; however, funding a local currency tied to the support of local businesses and communities, especially in a long-term project, which manages to retain the element of social trust within the participants, could indirectly augment (or maintain) the value of these alternative currencies over time.

As these few observations show, there is no formal erosion of the State monopoly over the legal construct of money. There is however a conscious use of the instruments provided by contractual freedom to pursue social and communitarian projects which in practice and intentionally, aim –at least– at supplementing the exclusive competence of the State.

Finally, it is also noteworthy that from the regulatory side both at a European level and at national levels (principally through the voice of Central Banks) these phenomena have not been ignored, but rather analyzed only to arrive to the conclusion that –mostly due to their limited size– they do not pose a threat to national monetary systems³⁵.

Equally interesting, is the fact that regulators have taken an interest and have begun to pay closer attention to complementary currencies with the development of virtual currencies (comprising a wide panoply

ed. transl. by P. Pye, Neo-Verlag, Berlin, 1929).

³⁴ For an overview of the schemes of existing regional currencies in the first years 2000, see G. RÖSL, *Regional currencies in Germany- local competition for the Euro?*, *Deutsche Bundesbank Discussion Paper*, Series 1, No.43/2006.

³⁵ See for the UK, M. NAQVI, J. SOUTHGATE, *Banknotes, local currencies and central bank objectives*, in *Bank of England Quarterly Bulletin*, Vol. 53 n.4, 2013 Q4, 317, pgs.323-324; see also G. RÖSL, *Regional currencies in Germany- local competition for the Euro?*, cit., for Germany, analyzing the numerous regional local currencies which fall into the category of ‘depreciative currency’ which loses value on predetermined timescale; or the unsuccessful attempts by the Italian legislator to regulate the phenomenon, with a proposal for a Bill on complementary currencies (including both the scheme of backed currencies and the scheme of mutual credit currencies) presented in 2014 that never made its way to approval (Proposta di legge n.2582/2014); followed by another proposal in 2018 (DDL n.777/2018), again discontinued.

of different digital instruments³⁶). The development of cryptocurrencies more specifically, can be reconducted to the same phenomenon of social erosion of the exclusive monopoly of the State over money, in pursuance of a political manifesto founded, *inter alia*, on the idea of denationalization of money³⁷. In more than a case, this is even expressly declared by some of the first creators of cryptocurrencies, sometimes defined as ‘Cypherpunks’, in more or less famous communications³⁸.

Virtual currencies could be analyzed both as ‘social and cultural’ constructs of money, and as ‘technological constructs’ of money. Since the relevance of the phenomenon is principally due to its technological characteristics, it seems more appropriate to analyze it under the latter (purely didactic) category.

³⁶ A well-known classification made by the European Central Bank in 2012 classified ‘virtual currencies’ (comprising different schemes and including those referred to as ‘cryptocurrencies’ when they use cryptography for the validation of their circulation), according to their relation with ‘real money’ and the ‘real economy’ (i.e. if and how the monetary flow between virtual currencies and real currencies work, and if and how virtual currencies can be used to purchase real goods and services). According to these parameters, virtual currency schemes have been divided into a) closed virtual currency schemes (that have scarce, if any, interaction with the real economy, and include currencies used for online games); b) virtual currency schemes with unidirectional flow (that imply an irreversible conversion at a specific exchange rate from the ‘real currency’ to the ‘virtual currency’ that can then be used both to buy virtual and real goods and services, and include ‘credits’, ‘vouchers’, ‘points’ or other ‘bonus’ systems); c) virtual currency schemes with bidirectional flow (virtual currencies can be bought and sold on online exchange platforms according to exchange rates with real currencies, and can be used to purchase both virtual and real goods and services). The latter include Bitcoins, Ethereum and other well-known cryptocurrencies and are those on which the reflections will here focus. (See European Central Bank, *Virtual Currency Schemes*, October 2012, <<https://www.ecb.europa.eu/pub/pdf/other/virtualcurrencyschemes201210en.pdf>>, pgs. 13-15).

³⁷ On the influence of Friedrich Von Hayek’s theories, disclosed in *The Denationalisation of Money* (Institute of Economic Affairs, London 1976) on the development of cryptocurrencies, see *infra*.

³⁸ Notably the “Crypto Anarchist Manifesto” distributed in 1988 at a Conference and then published by Timothy May in 1992 <<https://www.activism.net/cypherpunk/crypto-anarchy.html>> and the publication of the Bitcoin Protocol “Bitcoin: A Peer-to-Peer Electronic Cash System” by anonymous founder Satoshi Nakamoto in 2008 <<https://bitcoin.org/bitcoin.pdf>>, but also the proposal in 2008 of the “Bit gold” by Nick Szabo.

4. *Money as a technological construct: virtual currencies and Central Bank Digital Currencies*

Although sharing with complementary local currencies the nature of forms of alternative money, founded on contractual autonomy and by no means endowed with the status of legal tender, cryptocurrencies subvert the idea of a tie with a local community, where the schemes – at least in the first phase of their development – are based on personal trust and the reputational credit that circulates within a small group. On the contrary, cryptocurrencies by vocation are constructed around the idea of a global, decentralized, non-state currency that can be exchanged online under quasi-anonymity³⁹.

Notoriously, a fundamental feature of the functioning of the cryptocurrency mechanism is that it is decentralized and ‘private’, since the public ledger (the decentralized ledger technology- DLT) that records ownership of the tokens functions without the control or the need either of a Central Bank, nor of a private bank or other credit institution and without a Central Clearing House. This decentralized system does not confer a power of control on monetary emission or of liquidity to a single central institution, and according to the ideology behind the Bitcoin scheme for example, this avoids some of the ‘effects’ (namely, inflation) of central banking policies. It thus comes as no surprise, that some observers have recalled analogies between the ideology of the Bitcoin and the doctrines

³⁹ Exemplifying from the original Bitcoin protocol, cryptocurrencies use Distributed Ledger Technology and cryptography to exchange and record the transfers of virtual tokens (creating blockchains, recorded on the ledger) through mechanisms of verification (decentralized consensus mechanisms) that are carried out by the users of the network (“peers” or “nodes”). In the case of Bitcoins, as a ‘reward’ (and as an incentive) for the activity of verification, which involves the solution of complex sequences of algorithms, the peer that solves the cryptographic problem is awarded with a new batch of cryptocurrencies that are automatically generated by the software (the so-called “mining” of new coins). Given that the number of possible combinations of algorithms (and of minting of new coins) is finite, and that the growth of bitcoins is predetermined and inelastic, Bitcoins can be considered chattels that are to a certain extent potentially ‘scarce’ and functionally closer to a form of ‘digital gold’ rather than of ‘digital currency’. Some observers have also expressed fears regarding a possibly inherently ‘deflationary’ nature of these tokens, where a sudden raise in their price of ‘purchase’/demand, provoked by an increase in the number of users, might incentivise users not to spend the Bitcoins but rather keep them as ‘scarce chattels’. (See ECB, *Virtual Currency Schemes*, cit., at p. 25, (with some criticisms towards these theories); See also R. GRINDBERG *Bitcoin: An Innovative Alternative Digital Currency*, in *Hastings Science & Technology Law Journal*, Vol. 4, 2012, 159, p.177 and ff.).

of the Austrian School of Economics and that some commentators have referred to Bitcoin as «Hayek money»⁴⁰.

Having mostly excluded that the various cryptocurrencies, more or less modeled on the scheme of the Bitcoin protocol, could qualify as official legal currency and considering the scheme within the category of 'private' monies, (thus 'alternative currencies' to a certain extent), scholarship and regulators have mostly debated on whether or not they should be considered as forms of securities. The issue of course concerns the wider category of crypto-assets and has emerged forcefully with the growth in crypto-asset token offerings which can create different risks (i.e. financial stability, market integrity, client/investor protection) to financial markets and which are the object of recent regulatory efforts (especially within the EU, where national financial laws adopt different qualifications of – and applicable regulation to- certain tokens)⁴¹. These regulatory concerns highlight the speculative nature of these tokens, confirming that they are closer to qualifying as investment instruments than they are to money.

Moreover, legal studies on cryptocurrencies from a decade ago were mostly centered on (and disquieted by) the absence of regulation of the new 'digital currency' that was developing online and the potential risks it could entail for unaware users, especially given its very high volatility. Ten years on, one can observe first of all a multiplication of DLT-based instruments

⁴⁰ See F. M. AMETRANO, *Hayek Money: the Cryptocurrency Price Stability Solution*, available on <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2425270>, highlighting that Bitcoins could be considered as the practical implementation of the theories of the Austrian School of Economics, especially those on the 'denationalisation of money' illustrated by Friedrich A. von Hayek in his book. This analogy however has also been met by criticism by some scholars who have highlighted that Bitcoins have no intrinsic value comparable to the gold standard nor do they meet the requirement of the 'Misean Regression Theorem' according to which acceptance and circulation of money depends on an intrinsic value it possesses (due to the fact that it is rooted in a commodity with purchasing power). See ECB, *Virtual Currency Schemes*, cit., p. 23.

⁴¹ The Italian case is emblematic, if one considers that virtual currencies do not qualify as payment services under the relevant legislation (i.e. d.lgs 11/2010 which transposed the PSD, which considers as payment services the payment transactions concerning banknotes or coins, scriptural money and e-money (none of which correspond to virtual currencies)), nor do they qualify as financial instruments (which is the case for example under US and German law) because the relevant legislation (*TUF*- d.lgs. n.58/1998, art. 1, c.2) excludes that payment instruments may qualify as financial instruments; they have therefore been considered possibly as 'financial products' (under the *TUF*, art. 1, letter u) «financial instruments and any other form of investment of financial nature»). See GRECO, *Valute virtuali e valute complementari, tra sviluppo tecnologico e incertezze regolamentari*, cit., pgs. 81-82.

having various features, commonly referred to as ‘crypto-assets’; and in the second place, an evolution from the initial anarchical, de-intermediated and decentralized market towards growing forms of regulation both at the national levels, and at a supranational level, notably in the EU with the adoption of the MiCA Regulation⁴².

The exponential growth in the market of crypto-assets, with important crises especially in the first 2020’s, and the failure of the markets to regulate themselves (also referred to as the «crypto-winter»), has spurred the need for coordinated legislative responses⁴³, especially considering the potential systemic risks deriving from these market failures⁴⁴.

Returning to thread of these reflections on alternative forms of money and potential erosion of the monopoly of the State over monetary instruments, one can first of all note that although crypto-currencies were initially conceived as a substitute of *fiat* currency for the scope of payments, and not-

⁴² The EU approved the Markets in Crypto Assets Regulation (MiCA or MiCAR) (Regulation (EU) 2023/1114 of the European Parliament and of the Council of 31 May 2023 in *OJ L 150*, 9.6.2023, p.40), as part of the 2020 Digital Finance Package (which also includes the Regulation 2022/858 on a Pilot Regime for market infrastructures based on distributed ledger technology (DLT)), with the scope of providing prudential regulatory treatment of crypto-assets (defined as «a digital representation of a value or of a right that is able to be transformed and stored electronically using distributed ledger technology or similar technology» Art. 3(1)(n.5) MiCA).

Crypto-assets can be designed in different ways and can comprise various rights (which range from financial interests in a company to other non-financial rights); they are often grouped into the three macro categories of a) utility tokens (granting some sort of access or rights to use a company’s ecosystem, goods, or services, usually with the scope of enabling functional use of a blockchain-based ecosystem); b) security/financial/investment tokens (tied to an underlying asset of which they represent a fractional ownership of the overall value and which are regarded as financial products, securities, financial instruments, derivatives or collective investment schemes); c) currency/payment tokens (functionally conceived as fulfilling the economic criteria of money, and including both schemes like the Bitcoin and schemes of stablecoins (e.g. the Libra -later Diem- scheme) also referred to as ‘asset-referenced tokens’). See D. A. ZETZSCHE, F. ANNUNZIATA, D.W. ARNER, R. P. BUCKLEY, *The Markets in Crypto-Assets Regulation (MiCA) and the EU Digital Finance Strategy*, *EBI Working Paper Series* 2020 n. 77, available on SSRN: <<https://ssrn.com/abstract=3725395>> p.5 and ff.

⁴³ F. ANNUNZIATA, *An Overview of the Markets in Crypto-Assets Regulation (MiCAR)*, *EBI Working Paper Series*, 2023 n.158, available on SSRN: <<https://ssrn.com/abstract=4660379>>, pgs. 4-5

⁴⁴ More specifically for the scope of these observations, with regards to the category of crypto-assets that qualify as payment tokens (which include asset-referenced tokens (ARTs) and e-money tokens (EMTs), it should be noted that the MiCA regulates payment tokens essentially by requiring authorization, imposing rules on safeguard, reserve and own funds, and rules on disclosure (MiCA Titles III and IV).

withstanding an initial hype towards these instruments, both certain technical difficulties (for example the need to set up digital wallets; the minor speed of the transactions compared to other digital means of payment), and the instability of the cryptocurrencies not structured as stable-coins, have somewhat hindered their development as widespread substitutes of money or of other digital payment services. As recent data indicate, there has not been a wide-scale use of crypto-assets for retail payments for example, and the reason of most holdings of crypto-assets is declared to be for investment purposes⁴⁵. Their nature, as previously highlighted, therefore seems to set them closer to that of investment instruments rather than covering the 'exchange' function that is attributed to money.

However, the expansion of crypto-assets, and especially the growth in projects of private stablecoins (such as the famous announcement of Meta's 'Libra') have posed serious considerations on whether this could constitute a threat to State control over monetary instruments. This is undoubtedly one of the reasons that have provoked an acceleration in the projects for the adoption of 'State' digital currencies, also known as Central Bank Digital Currencies (CBDCs).

Indeed, projects and pilot implementations of CBDCs are making progress across global economies⁴⁶, including the European Union with the project for a retail digital euro released by the European Central Bank and a Proposal for a Regulation on the establishment of the digital euro⁴⁷. These projects are driven by a variety of motivations including, *inter alia*, the decrease in the use and demand for cash, the competition brought by private digital currencies and stablecoins as well as by third country projects of CBDCs, the availability of distributed ledger technology and the desire to apply it to centralised forms of administration⁴⁸.

⁴⁵ See the ECB 2022 *Study on the payment attitudes of consumers in the euro area* (SPACE), pgs. 55 and ff. and European Commission, *Commission Staff Working Document Impact Assessment Report, Proposal for a Regulation of the European Parliament and of the Council on payment services in the internal market and Proposal for a Directive of the European Parliament and of the Council on payment services and electronic money services* (COM (2023) 366 final), p.4.

⁴⁶ An updated *tracker* of the progress of CBDCs has been created by the Atlantic Council <<https://www.atlanticcouncil.org/cbdctracker/>>.

⁴⁷ Proposal for a Regulation of the European Parliament and of the Council on the establishment of the digital euro, COM(2023) 369 final, 28.6.2023.

⁴⁸ In the case of the European project for a digital euro, additional motivations include support for the digitalisation processes of the European economy, by providing an official central bank digital means of payment (insomuch as cash alone is insufficient to support the digital economy and currently only private digital means of payment are available);

The different underlying motivations for adopting CBDCs are obviously influential in the choice of characteristics for these currencies. CBDCs can be designed with various options, according to the users for whom they are intended; whether they are a retail or a wholesale version of the currency; whether their access is direct or intermediated. Options include the technology used for their transfer (through an account-based system or as a bearer instrument) and for payments (online only or also offline; as a web-based service or also through dedicated physical devices such as smart cards). Furthermore, CBDCs can be designed so as to allow or limit the possibility of using them as an investment instrument and they may or may not have legal tender⁴⁹.

enhancing the development of pan-European and interoperable retail payment solutions; enhancing the resilience of the European retail payments market and maintaining the role (and market share) of the euro in it (See the Proposal for a Regulation on the establishment of the digital euro).

For a reconstruction of the reasons and context in which projects on CBDCs have been conceived see, *ex multis*, C. BARONTINI, H. HOLDEN, *Proceeding with Caution- A Survey on Central Bank Digital Currency*, *BIS Papers* n.101, 2019; N. BILOTTA, F. BOTTI (Eds.), *The (Near) Future of Central Bank Digital Currencies. Risks and Opportunities for the Global Economy and Society*, Peter Lang, Bern- Berlin- Bruxelles- New York- Oxford- Warszawa- Wien 2021); G. BOSI, *Taking CBDC Seriously*, in *Banca Impresa Società* vol.39 Iss.1 2020, 67; M. K. BRUNNERMEIER, HAROLD JAMES, J.-P. LANDAU, *The Digitalization of Money*, *NBER Working Paper Series* No.26300, 2019; A. N. DIDENKO, R. P. BUCKLEY, *The Evolution of Currency: Cash to Cryptos to Sovereign Digital Currencies*, in *Fordham International Law Journal* Vol. 42, 2019, 1041; E. GNAN, D. MASCIANDARO (Eds.), *Do We Need Central Bank Digital Currency? Economics, Technology and Institutions*, Suerf Larcier, Wien 2018; S. NEVA GRÜNEWALD, C. ZELLWEGGER-GUTKNECHT, B. GEVA, *Digital Euro and ECB Powers*, in *Common Market Law Review* Vol. 58, 2021, 1029; H. NABILOU, *Central Bank Digital Currencies: Preliminary Legal Observations*, 2019, available on SSRN : <<https://ssrn.com/abstract=3329993>>; M. RASKIN, D. YERMACK, *Digital Currencies, Decentralized Ledgers, and the Future of Central Banking*, *NBER Working Paper* No.22238, 2016; D. A. ZETZSCHE, R. P. BUCKLEY, D. W. ARNER, A. N. DIDENKO, L. J. VANROMBURG, *Sovereign Digital Currencies: The Future of Money and Payments?*, in *UNSW Law & Justice Research Series* n.30, 2023.

⁴⁹See European Central Bank, *Report on a digital euro*, October 2020 <https://www.ecb.europa.eu/pub/pdf/other/Report_on_a_digital_euro-4d7268b458.it.pdf#page=27>. The Proposal for the Regulation for the Establishment of the Digital Euro, has for example made clear that several options were considered, following the consultation process with various stakeholders, «to achieve the policy objectives while balancing key trade-offs: (i) enabling wide usage while ensuring fair competition with private payment solutions, (ii) protecting privacy while ensuring traceability, (iii) ensuring wide usage while protecting financial stability and credit provision, and (iv) supporting international use while mitigating risks for non-euro countries and the Eurosystem.» (See Proposal for a Regulation on the establishment of the digital euro, p. 9.)

The interest in CBDCs in analysing the legal construct of money arises, *inter alia*, from the observation that these digital currencies, especially where endowed with legal tender, represent a distinct combination of the three perspectives recalled so far. Indeed, as a direct issue of Central Banks by which they are backed, and officially qualified as the digital version of legal currency, they respond to the ‘legal’ – and to the ‘State’- notions of money. It is worth noting furthermore, that when compared with cryptocurrencies, CBDCs express an antithetical conception of the monetary phenomenon: the stateless, anarchic, private, denationalised currency in the case of cryptocurrencies; a digital currency issued and above all guaranteed by central banks in the case of CBDCs⁵⁰. Their digital nature, representing one of the most relevant examples of digitalization of financial services, of course vouches the importance of a technological construct of money.

There are however also strong social and cultural aspects that emerge in the projects on CBDCs, that indicate that these currencies need to comply with certain requirements if they are to actually gain the confidence and acceptance of users. With reference to these last aspects, it is interesting to note that the public opinion in the euro area has not shown enthusiasm towards the project of a European CBDC (especially when compared to the enthusiastic reaction to the appearance of cryptocurrencies). One of the challenges facing the ECB and other Central Banks is whether or not users will actually choose payments with the digital euro over other electronic payment instruments or cash⁵¹.

This is where one finds the most interesting observations regarding the

⁵⁰ Since projects for the adoption of CBDCs have been triggered also as a response to the spread of ‘private’ cryptocurrencies, it is not surprising that there are strong references to the secure, official and guaranteed nature of the digital Euro in the official documents released by the ECB and its task force; a clear intent to highlight a difference with the risks and uncertainties known to be associated with cryptocurrencies.

⁵¹ Where pilot projects have been launched, such as the Digital e-Yuan (e-CNY) rolled out in China in 2020, the data available for the first period (2022) indicated a slow start, with a much lower percentage of transactions with the official CBDC than with the private sector alternatives (i.e. Alipay and WeChat). See I. ANGELONI, *Digital Euro: When in doubt, abstain. In-Depth Analysis Requested by the ECON committee*, European Parliament, April 2023, <[https://www.europarl.europa.eu/RegData/etudes/IDAN/2023/741507/IPOL_IDA\(2023\)741507_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/IDAN/2023/741507/IPOL_IDA(2023)741507_EN.pdf)>, p.16; see also the analysis by the Foreign Policy Research Institute <<https://www.fpri.org/article/2023/06/china-is-doubling-down-on-its-digital-currency/>>. Relevant data are also summarized by the Atlantic Council tracker. For a wider review of the development of digital banking and the progress of the e-CNY in China, see F. ALLEN, X. GU, J. JAGTIANI, *Fintech, Cryptocurrencies, and CBDC: Financial Structural Transformation in China*, Federal Reserve Bank of Philadelphia Working Papers No.22-12, 2022.

notion that money has from a cultural and social perspective. Indeed, the principal concerns expressed by European citizens regarding a digital euro are tied on the one side to privacy and data protection⁵² (namely the fear of the ‘State’ – but also private intermediaries- tracking one’s payments, which becomes technically straightforward whenever transactions are made using digital instruments); on the other side, worries regarding financial exclusion (namely the apprehension over the disappearance of cash⁵³). These concerns, without considering the cases of those relying on cash for the pursuit of illegal activities, demonstrate that there are two features that seem inextricably tied to the cultural notion (in many countries, Italy being a prominent example⁵⁴) of ‘money’: anonymity and tangibility.

The ECB has reacted to these concerns by repeatedly affirming that the digital euro will not substitute physical banknotes and coins but will provide an additional form of legal tender⁵⁵. Special measures have also been included to ensure access to the digital euro for those who do not have a bank account, nor can afford a payment card⁵⁶.

Regarding privacy, the Proposed Digital Euro Regulation, which devotes its Chapter VIII to “Privacy and data protection”, defines the

⁵² This is manifested in the various working documents released by the ECB and in the results of the public consultation phase on the digital euro <https://www.ecb.europa.eu/pub/pdf/other/Eurosystem_report_on_the_public_consultation_on_a_digital_euro-539fa8cd8d.en.pdf>; as well as in the impact assessment on the Proposal for a Regulation on the establishment of the digital euro.

⁵³ On the relation between financial exclusion and ‘cashless’ societies, see the analysis by Federico Lupo-Pasini who highlights the risk of so-called ‘monetary exclusion’ for ‘unbanked’ individuals who are excluded from both the credit system and the cashless payment system (See F. LUPO-PASINI, *Financial Inclusion and the “War for Cash”*, in *Law and Contemporary Problems* Vol. 84, n.1, 2021,17, p.20).

⁵⁴ See the ECB 2022 *SPACE Study* and Banca d’Italia, *Report on the payment attitudes of consumers in Italy: results from the ECB SPACE 2022 survey*, in *Markets, Infrastructures, Payment Systems*, n. 42, 2023, p. 12 and ff., breaking up data on payment habits according to value, type of transaction, regions, segment of the population.

⁵⁵ See for example ECB, *A stocktake on the digital euro. Summary report on the investigation phase and outlook on the next phase*, p.15, defining the digital euro «As a complement to cash in the digital age, a digital euro would be a public good for people to use in all their everyday digital payments»; but also assuring that it would «exist alongside euro cash» (p.4), and «would provide an additional payment option to complement cash and current private digital payment solutions (rather than replace them) » (p.8). See <https://www.ecb.europa.eu/paym/digital_euro/investigation/profuse/shared/files/dedocs/ecb.dedocs231018.en.pdf> .

⁵⁶ Article 14 Proposal for a Regulation on the establishment of the digital euro; see also article Article 17(2) of the Proposal, establishing caps on fees to be paid on basic digital euro payment services.

tasks for which payment service providers, the ECB and national central banks may process personal data, including for the latter the settlement of digital euro payment transactions, and states that the processing of personal data should be based on the use of state-of-the-art security and privacy-preserving measures, such as pseudonymization or encryption, to ensure that payment service providers, the ECB and national central banks cannot directly attribute data to an identified digital euro user⁵⁷. The dubious efficacy of this type of provisions has led to qualifying the introduction of these measures as a case of «privacy-washing»⁵⁸.

More in general, data protection is also relevant from the perspective of potential consequences in terms of financial exclusion, especially as regards a possible impact on access to credit. Indeed, the data used for payments, particularly on digital platforms, constitute, from the point of view of the variety of users and activities performed, formidable aggregates on the economic behaviour of users/consumers⁵⁹. These data, as is widely known, constitute the basis for algorithmic and big data credit scoring techniques, which are used to assess the creditworthiness of loan applicants⁶⁰. Hence

⁵⁷ Articles 34 and 35 Proposal for a Regulation on the establishment of the digital euro. Furthermore, the Commission is empowered to adopt delegated acts to update the types of personal data processed by payment service providers, the ECB and national central banks.

⁵⁸ See ZENO-ZENCOVICH, *Digital Euro as a platform and its private law implications*, cit., pgs. 208-209, highlighting that the digital euro, like all other forms of electronic payment, is by its very nature a traceable instrument; and interpreting the inclusion of a data protection Chapter in the regulation proposal as «privacy-washing», with the «function of reassuring the public of an equivalence [between payment in cash and payment in electronic form] that in reality does not exist».

⁵⁹ The European Data Protection Supervisor has confirmed these concerns on CBDCs and has highlighted how «Wrong design choices might worsen data protection issues in digital payments: payment data already reveals very sensitive aspects of a person. Wrong design choices in the underlying technological infrastructure might exacerbate the privacy and data protection issues that already exists in the digital payment landscape. For example, transactional data could be unlawfully used for credit evaluation and cross-selling initiatives».

The EDPS has also considered as additional negative foreseen impacts on data protection the following: a) concentration of data in the hands of central banks, that could generate incentives for cyberattacks and a high systemic risk of individual or generalised surveillance in case of data breaches or, more in general, unlawful access; b) lack of security in the CBDC infrastructure, that may turn into severe lack of trust from users. See <https://www.edps.europa.eu/press-publications/publications/techsonar/central-bank-digital-currency_en> .

⁶⁰ Please see N. VARDI, *Creditworthiness and Responsible Credit. A Comparative Study of EU and US Law*, Brill Nijhoff, Leiden-Boston 2022, p. 97 and ff. and the literature cited therein.

the strategic importance that data protection of digital euro users assumes as a determining factor for the access to credit, especially for individuals who face higher risks of discrimination⁶¹. It is also worth noting though, on the other hand, that the use of non-financial data in algorithmic credit scoring could favour individuals with so-called ‘thin credit history’ or who are ‘credit invisible’, whose access to credit may otherwise be jeopardised by an insufficient credit history⁶².

⁶¹ Policies promoting access to credit are in fact historically framed first of all as ‘negative’ antidiscrimination regulations, such as the legislation enacted in the United States in mid 1970’s, with the Equal Credit Opportunity Act, the Fair Housing Act, and the Home Mortgage Disclosure Act; or in Europe with the EU Charter of Fundamental Rights and the general Directives prohibiting discrimination (i.e. the Racial Equality Directive; the Goods and Services Directive) applied to access to credit and financial services.

⁶² See M. A. BRUCKNER, *The Promise and Perils of Algorithmic Lenders’ Use of Big Data*, in *Chicago-Kent Law Review* Vol. 93, 2018, 3, pgs. 5-6. This last aspect is closely related to the fear that the introduction of the digital euro could provoke a credit crunch. The concern stems from the possible competition of Central Banks to financial intermediaries on deposit funds, should the digital euro become attractive from a remunerative point of view; this would result in a migration of deposits to Central Banks, which would dry up the deposits of private credit institutions and reduce the availability for the latter of funds for household and corporate lending. See the considerations by ANGELONI, *Digital Euro: When in doubt, abstain*, cit. pgs.12-13; and T. AHNERT, P. HOFFMANN, A. LEONELLO, D. PORCELLACCIA, *CBDC and Financial Stability*, *ECB Working Paper Series No. 2783*, 2023 on the relationship between bank fragility and CBDC remuneration. See however J. ABAD, G. NUÑO, C. THOMAS, *CBDC and the Operational Framework of Monetary Policy*, *Banco de España, Documentos e Trabajo No.2404*, 2024, predicting that the ‘deposit crunch’ deriving from the adoption of a CBDC has a rather small effect on bank lending (i.e. ‘credit crunch’) to the real economy (differentiating effects according to whether adoption of the CBDC is moderate or larger); and S. AUER, N. BRANZOLI, G. FERRERO, A. ILARI, F. PALAZZO, E. RAINONE, *CBDC and the banking system*, *Banca d’Italia, Questioni di Economia e Finanza (Occasional Papers) No. 829*, 2024, p.6, suggesting that individual holding limits and an environment characterized by ample liquidity and stable funding for credit institutions would render the impact of a CBDC on the funding structure of credit institutions manageable.

Beyond the measures hypothesized to reduce this risk (including, principally, a cap on the maximum holdings *per capita* of deposits in digital euros and a possible differentiation of remuneration rates so as to disincentivize large deposits, via so-called ‘tiering’ (see ANGELONI, *Digital Euro: When in doubt, abstain*, cit. p. 13), it is clear how a potential credit crunch would represent a typical case of disparate impact on the financially vulnerable groups.

5. Conclusive remarks

A final observation regarding the characteristics and functioning (*in fieri*) of the European CBDC, adds to the reflections made so far, in an attempt to trace the emergence of ever more relevant societal, cultural and technological constructs of money. Moving from a systematic perspective, the digital euro has been effectively defined not only as legal tender, but rather as constituting «a platform in the sense that computer science and socio-economic theories ascribe to it.»⁶³. The platform is used by a multiplicity of subjects (i.e. credit institutions, companies, public administrations, private citizens) to regulate their relationship and this implies that the issuers of the digital currency have a direct and global control over the platform, and carry out functions that are specific to digital networks and relationships. This entails that central banks, as issuers of CBDCs, will make use of «decision-making mechanisms typical of the digital world (big data, user profiling, predictive analytics, artificial intelligence)»⁶⁴.

This construction of CBDCs naturally affects the way in which monetary sovereignty – but also monetary policies- are implemented, further confirming that the monetary phenomenon requires multiple reading lens. The contribution of comparative methodology and of an interdisciplinary approach in this quest continues to prove essential.

⁶³ ZENO-ZENCOVICH, *Digital Euro as a platform and its private law implications*, cit., p. 216

⁶⁴ ID, *ibidem*.