Unlimited Central Bank Digital Currency: The Case for a Public Good in the Euro-area and Its Regulatory (and Deregulatory) Implications for Modern Finance

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Introduction

Central banks in developed financial jurisdictions such as the United States,[1] European Union (EU)[2] and United Kingdom (UK)[3] have increasingly explored issuing a central bank digital currency (CBDC). Despite the articulated rationale in these policy papers, this article argues that CBDC can potentially offer far-reaching effects and ramifications beyond the coverage of these policy papers. In particular, we focus on the EU in teasing out these far-reaching effects, which we argue are both timely and important. The banking sector in the Euro-area (i.e., the part of the EU that adopts the common currency of the euro) has in particular been heavily impacted since the global financial crisis of 2007-2009 and its regulatory aftermath.[4] We argue that the CBDC for the Euro-area can bring about much-needed shaking up for the banking sector towards healthier transformation, as well as provide new policy options for central banks and policy-makers who oversee economic growth and financial stability in the Euro-area.

European bank regulation has tightened considerably after the

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1 *See* Bd. of Governors of the Fed. Rsrv. Sys., Money and Payments: The U.S. Dollar in the Age of Digital Transformation 1 (2022).

2 *See* EURO. CENT. BANK, REPORT ON A DIGITAL EURO 3 (2020).

3 *See* BANK OF ENG., CENTRAL BANK DIGITAL CURRENCY: OPPORTUNITIES, CHALLENGES, AND DESIGN 5 (2020).

4 EILÍS FERRAN ET AL., REGULATORY AFTERMATH OF THE GLOBAL FINANCIAL CRISIS 1-29 (2012).

global financial crisis.[5] Such reform is aimed at preserving the resilience of the banking sector in serving its economic and social purposes, as well as to avoid the repetition of massive bailouts[6] of banks by many governments during the crisis. Heightened regulatory frameworks in *ex ante* resilience (capital adequacy,[7] loss absorption,[8] liquidity[9] and leverage[10] requirements) and recovery and resolution planning[11] have been imposed on banks after the global financial crisis.

Although post-crisis regulation has prevented the collapse of confidence in the European banking industry, the sector has been radically impacted by regulation in terms of its business performance and activities, and there is a marked trend in the Euro-area in relation to banks moving away from the full intermediation of retail deposits (the "de-retailing" trend). This article highlights factual observations[12] of this trend in many parts of Europe, showing banks' decreased willingness to accept deposits, usually beyond a certain level, while also not being able to allocate their excessive liquidity effectively. Institutional and market structures in the Euro-area arguably contribute to this trend,[13] as such a trend is not as apparent in other jurisdictions such as the UK.[14]

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5 *See infra* Section I.A.

6 Viral Acharya et al., *Euro Area Bank Bailout Policies After the Global Financial Crisis Sowed Seeds of the Next Crisis*, CTR. FOR ECON. POL'Y RSCH. (Aug. 10, 2020), https://voxeu.org/article/euro-area-bank-bailout-policies-after-global-financial-crisis-sowed-seeds-next-crisis [https://perma.cc/T6S6-PFKT].

7 *See* Council Directive 2013/36, art. 1, 2013 O.J. (L 176) (EU); *see also* Council Regulation 575/2013, art. 4, 2013 O.J. (L 176) (EU).

8 *See* Council Directive 2014/59, art. 45, 2014 O.J. (L 173) (EU) [hereinafter BRRD] (bank recovery and resolution).

9 *See* Council Directive 2013/36, 2013 O.J. (L 176) (EU).

10 *See* Council Regulation 2019/876, art. 92, 2019 O.J. (L 150) (EU).

11 *See* BRRD, *supra* note 8.

12 *See infra* Part I.

13 *See infra* Part I.

14 In the UK, for example, there is still intense competition by deposit-takers for deposits as a source of funding financial intermediation. *See* Stefan Wagstyl, *Challenger Banks Raise Deposit Rates in Funding Drive*, FIN. TIMES, (Sept. 2, 2021) https://www.ft.com/content/5db8483e-18b3-418a-bf7b-d96dc534f4b1 [https://perma.cc/HGE8-9TT5]. This may be due to the UK's regulatory regime that compels universal banking groups to ring-fence retail banking business, hence creating a distinct sector of retail banking that does not engage with an extensive form of financial intermediation. *See* Financial Services and Markets Act 2000, c.8, §§ 142A-142G (UK). The UK welcomes challenger banks, many of which are small to begin with and compete

The trend above raises worrying concerns regarding financial inclusion and meeting social needs of basic store of value. Further, as discussed later, European banks have become less competitive and profitable. At this juncture, we perceive opportunities for the banking sector to break out of its plight in light of the Eurosystem's[15] interest in offering a central bank digital euro (CBDE),[16] which provides a public good of digital public money. This article argues that the advent of the CBDE, contrary to the Eurosystem's policy paper,[17] should not be too modest, but should be "unlimited" in terms of cash and deposit substitution in order to maximize the Eurosystem's role in providing the public good of risk-free store of value. Such public good need not exclude the private sector[18] but can involve the private sector in providing custodial, security and payment services.[19] The CBDE would however be central bank money, a claim upon the Eurosystem and not a new form of virtual private money.[20] By removing social expectations upon the banking sector to provide a store of value service for the general public, we argue that the banking and financial sector is better facilitated towards innovation and transformation that can make the sector more competitive and better

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in the retail markets. Further, PwC's prediction of retail banking trends from 2020 also mention that deposit-taking as a source of funding is likely to remain important to match local lending needs. *See* PWC, RETAIL BANKING 2020: EVOLUTION OR REVOLUTION? 14 (2020).

15 The Eurosystem consists of the European Central Banks (ECB) and the national central banks of the nineteen member states of the European Union (EU) whose shared currency is the euro. The Eurosystem must be distinguished from the European System of Central Banks (ESCB), which consists of the ECB and the national central banks of all twenty-seven EU member states. The ESCB was supposed to become the monetary authority of the Euro-area, but this vision failed because several EU member states decided to keep their national currencies or have so far not met the criteria for their inclusion in the Euro-area. The EU treaties still refer to the ESCB as the competent monetary authority of the Euro-area, but it is the Eurosystem that actually holds this role. The ESCB is merely an organizational framework that facilitates the exchange between the Eurosystem and the central banks of the EU member states that remain outside the Euro-area. *See* Francisco-Javier Priego & Fernando Conlledo, *The Role of the Decentralisation Principle in the Legal Construction of the European System of Central Banks*, *in* LEGAL ASPECTS OF THE EUROPEAN SYSTEM OF CENTRAL BANKS 189, 190 (2005).

16 *See infra* Part II.

17 *See* EUR. CENT. BANK, *supra* note 2.

18 *See infra* Part IV.

19 *See infra* Part IV.

20 *See infra* Part II.

equipped to intermediate more effectively for real economy needs.

The transformation of the banking and financial sector is further important for central banks and bank regulators,[21] as their policies have been inevitably shackled in order to preserve bank stability in the Euro-area, given the size of the bank-based economy. In particular, we argue that such policy unshackling can more optimally occur under the implications of our proposal. The application of monetary policy, chiefly to affect financial institutions' behavior, can potentially be widened or rethought in relation to affecting the real economy more effectively (discussed in Part II). Further, the European Central Bank's (ECB's) bank supervision role can also change, as the implications of bank and financial sector transformation resulting from the introduction of CBDE can give rise to reduced need for the maintenance of current levels of bank regulation (Part III). The potential for regulatory change would likely benefit and facilitate bank and financial sector transformation towards greater innovation and competitiveness.

Part I discusses the impact of the post-crisis regulatory frameworks on the European banking sector and adverse effects upon banks' relationship-based lending model. Although banks are less incentivized to stick to this model post-crisis, policymakers continue to assume the dominance of such lending. These assumptions affect the Eurosystem's monetary policy decisions, which further affects banks' incentives and behavior. We witness Euro-area banks' constant underperformance and attempts to shift away from traditional business models, bringing about a trend of decline for the retail deposit business in this process, which can adversely affect the public's need for basic store of value and financial services.

Part II proceeds to discuss how the adverse trend we observe in Section I may be addressed by a CBDE issued by the Eurosystem. In this Part, we depart from the commonly articulated rationale for the CBDE in somewhat narrowly framed policy papers, and instead see the CBDE as a public good replacing the store of value service provided currently by the banking sector (which is the private sector). However, more than just public good provision, we discuss why the CBDE should be unlimited in issuance, departing from policy papers' positions, in order to better serve industry and the Eurosystem's goals. The benefits for the bank and financial sector

21 *See infra* Section II.B.3.

in the Euro-area, as well as for the Eurosystem, are drawn out in this Part II.

Part III discusses how an unlimited CBDE model further gives rise to opportunities for revisiting the post-crisis regulatory frameworks that have inevitably shaped bank business and behavior. In particular, we argue that a deregulatory agenda that addresses the key burdens and unintended consequences for banks can be implemented. This Part proposes a deregulatory agenda in selected respects and argues that these would not detract from public interest objectives including depositor protection and financial stability. Such an agenda is likely to benefit and reinforce bank and financial sector transformation and also has salutary implications for bank supervision which is performed in the Euro-area under the leadership of the ECB.

Finally, Part IV discusses how the unlimited CBDE model can be implemented and the possibilities to which this would give rise in terms of financial sector landscape changes. This Part also discusses new regulatory implications for such changes. Part V provides a brief conclusion.

I. The Uncompetitive and Unprofitable Banking Sector in the Euro-area?

Before we embark on what the CBDE can potentially do for the industry, policymakers and society in the Euro-area, we need to consider the context of the uncompetitive and unprofitable banking sector in the Euro-area at present. There are two key aspects to this context. First, the Euro-area is a typical representative of a jurisdiction that is negatively affected by the "iron law of financial regulation"[22] (as discussed in Section I.B *infra*) since the onset of the global financial crisis of 2007-2009, and the second is that the Euro-area banking sector is undergoing significant change in terms of its funding bases and its full intermediation role.

A. The Euro-area as Subject to the "Iron Law of Financial Regulation"

In her recent Wallenberg lecture, Professor Roberta Romano used the term "iron law of financial regulation" for a well-known

22 Roberta Romano, 2021 Wallenberg Lecture: The Iron Law of Financial Regulation at the European Corporate Governance Institute (Oct. 28, 2021).

phenomenon.[23] A financial crisis puts a regulatory framework to the test which, in most cases, entails policy responses that usually follow a common pattern. A new and stricter layer of regulation is added to all pre-existing principles.[24] The results are more complex, burdensome and expensive rules for financial institutions and more challenging tasks for regulators and supervisors which must monitor and enforce compliance. The global financial crisis which reached its peak in 2007-2009 is a textbook example for such developments.[25]

Our article does not assess whether these regulatory responses to the global financial crisis were without alternative. However, we now have data, in a decade after the worst of the crisis has passed, that tells us that the banking sector in the Euro-area has been underperforming in comparison to its counterparts in the rest of the world.[26] The profitability (measured as returns on equity) of banks is low in most EU countries.[27] In the EU-27, profitability was 2.3% in 2020.[28] In the Euro-area, profitability dispersion is high with exceptional high performers in some eastern European member states seeing double digit profitability rates.[29] This contrasts with negative rates in some parts of southern Europe and sobering numbers in the Euro-area's biggest countries with 4.1% (France),

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23 *Id*.

24 Extensive bank regulation since the global financial crisis can be found at *The Basel Framework*, BANK FOR INT'L SETTLEMENTS, https://www.bis.org/basel_framework/index.htm [https://perma.cc/D7KR-P6BX] (last visited Nov. 28, 2022); discussion of implementation in the EU and UK is found in IRIS H-Y CHIU & JOANNA WILSON, BANKING LAW AND REGULATION chs. 8, 9, 13 (2019).

25 The extensiveness and volume of post-crisis financial regulation can be observed in the length of the U.S. Dodd-Frank Act of 2009, as well as the Single Rulebooks adopted in the EU. *See* Dodd-Frank Wall Street Reform and Consumer Protefction Act (Dodd-Frank Act), Pub. L. No. 111-203, 124 Stat. 2376 (2010); *see also Regulation and Policy*, EUR. BANKING AUTH. https://www.eba.europa.eu/regulation-and-policy/single-rulebook/interactive-single-rulebook [https://perma.cc/3KAM-J3EW] (last visited Nov. 28, 2022); Eddy Wymeersch, *European Financial Regulation: How to Make It More Workable* (Ghent Univ. Fin. L. Inst., Working Paper No. 2016-04, 2016); *infra* Part III (discussing the key burdens of the "iron law," which we argue can be considered for adjustment if an unlimited CBDE model proposed in this article were implemented).

26 *See infra* note 32 and accompanying text.

27 Ioanna Avgeri et al., *Bank Profitability in the Euro Area: The Asymmetric Effects of Common Supervision* 9 (LEQS Paper No. 170/2020, 2021).

28 *See* FRANCISCO SARAVIA, EUR. BANKING FED'N, BANKING IN EUROPE: EBF FACTS & FIGURES 2021 22 (2021).

29 *Id*.

2.2% (Germany) and 1.0% (Italy) on average (2008-2020).[30] The EU average peaked at 5.4% in 2018.[31] These numbers remain far below those in the United States where banks saw profitability rates increase strongly after the crisis years 2007-2009 and peaked in 2019 at around 12% on average before dropping to 5% in 2020 (the year of the start of the Covid-19 outbreak).[32]

Further, the regulatory rulebooks for European banks have become inordinately long, detailed and complex,[33] and the monitoring and enforcement of compliance with financial regulation has become substantially more costly in the Euro-area, requiring the creation of new authorities such as the European System of Financial Supervision (ESFS),[34] Single Resolution Board (SRB),[35] arguably also the European Stability Mechanism (ESM),[36] and entirely new tasks for pre-existing authorities such as the ECB[37] and financial supervisory agencies known as national competent authorities (NCAs)[38] in member states.

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30 For German banks' low profitability since 2008, see SARAVIA, *supra* note 28, at 22-23; IMF, *Germany*, IMF Country Report No. 21/13 (Jan. 2021).

31 SARAVIA, *supra* note 28, at 28.

32 *Return on Average Equity for All U.S. Banks*, FED. RSRV. BANK OF ST. LOUIS , https://fred.stlouisfed.org/series/D10ROE [https://perma.cc/CY27-VEM2] (last visited Nov. 28, 2022); INT'L MONETARY FUND, GLOBAL FINANCIAL STABILITY REPORT: MARKETS IN THE TIME OF COVID-19 68 fig.4.1 (2020).

33 These comprise legislation in the form of Directives and Regulations, subsidiary legislation issued by the European Commission, regulatory standards, as well as soft law in the form of guidelines issued by pan-European regulatory agencies which sit atop national bank and financial services regulators. *See* Commission Regulation 1093/2010, arts. 10, 15 & 16, 2010 O.J. (L 331) (EU) (levels of financial regulatory law); *see also* Wymeersch, *supra* note 25 (critical discussion).

34 As of 2010, European System of Financial Supervision (ESFS) comprises of new agencies. *See* Council Regulation 1093/2010, 2010 O.J. (L 331) 12 (EU) (European Banking Authority); Council Regulation 1095/2010, 2010 O.J. (L 331) 84 (EU) (European Securites and Market Authority); Council Regulation 1094/2010, 2010 O.J. (L 331) 48 (EU) (European Insurance and Occupational Pensions Authority).

35 *About Us*, SINGLE RESOL. BD., https://www.srb.europa.eu/en/about [https://perma.cc/UT9Q-5VTL] (last visited Nov. 28, 2022).

36 *Who We Are*, EUR. STABILITY MECHANISM, https://www.esm.europa.eu/about-us [https://perma.cc/CFE5-R24G] (last visited Nov. 28, 2022).

37 *See infra* Section II.D (discussing supervision role for European banks, in particular Euro-area banks).

38 NCAs are a shorthand for the bank regulators in each member state. For example, the BaFin is the NCA in Germany. *See European Banking Supervision*, BAFIN FED. FIN. SUPERVISORY AUTH., https://www.bafin.de/EN/Aufsicht/BankenFinanzdienstleister/EUBankenaufsicht/europa

This Section provides a sketch of the key burdens of the "iron law of financial regulation." More detailed sources elsewhere have discussed the following: the expansion of prudential regulation for the banking sector;[39] the extension of regulatory rules over all corners of the financial sector, particularly as regards various forms of shadow banking;[40] the uncovering of financial sector misconduct and rigorous enforcement;[41] the establishment and development of increasing regulatory and supervisory tasks as well as agencies;[42] and the establishment of the Banking Union and the vesting of bank supervisory tasks in the ECB and NCAs.[43]

The key burdens of this iron law, which we sketch below, impact the Euro-area's banking sector, affecting changes to their business models especially in relation to the full intermediation of retail deposits. Although the global banking sector is equally affected by the iron law, Euro-area banks are more heavily "doubly stung" by the effects of regulatory reform and the application of loose monetary policy discussed in Section I.B *infra*. We will argue

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eische_bankenaufsicht_artikel_en.html [https://perma.cc/78CJ-RJL8] (last visited Nov. 28, 2022).

39 *See* Iris H-Y Chiu, *Rethinking the Law and Economics of Post-Crisis Micro-Prudential Regulation: The Need to Invert the Relationship of Law to Economics?*, 38 REV. BANKING & FIN. L. 639, 655-56 (2019).

40 *See* Council Regulation 2017/1131, 2017 O.J. (L 169) (EU) (including the regulation of money market funds); *see also* Council Regulation 2015/2365, 2015 O.J. (L 337) (EU) (the regulation of securities financing transactions such as repo transactions); Council Directive 2011/61, 2011 O.J. (L 174) (EU) (the regulation of investment entities that were lightly regulated before the global financial crisis and that may be engaged with credit risk and significant levels of leverage); s*ee generally* JACQUES DE LAROSIÈRE ET AL., REPORT BY THE HIGH LEVEL GROUP ON FINANCIAL SUPERVISION IN THE EU 8 (2009).

41 Such as enforcement against benchmark manipulation in relation to London interbank offered rate (LIBOR) and Euro interbank offered rate (EURIBOR). *See* Priyank Gandhi et al., *Financial Market Misconduct and Public Enforcement: The Case of Libor Manipulation*, 65 MGMT. SCI. 1, 1-6 (2019); Rubén Herrera et al., *Can Euribor Be Fixed*?, 34 ECON. RSCH. 2833, 2836 (2021).

42 *See European System of Financial Supervision*, EUR. CENT. BANK, https://www.bankingsupervision.europa.eu/about/esfs/html/index.en.html [https://perma.cc/8UXY-HBJP] (last visited Nov. 28, 2022); *see also European Banking Supervision*, *supra* note 38; Eddy Wymeersch, *Europe's New Financial Regulatory Bodies*, 11 J. CORP. L. STUD. 443, 449-59 (2011).

43 *See* Council Regulation 1024/2013, 2013 O.J. (L 287) (EU) (SSM regulation); Council Regulation 806/2014, 2014 O.J. (L 225) (EU) (SRM (SRM) regulation); Iris H-Y Chiu, *Power and Accountability in the EU Financial Regulatory Architecture: Examining Inter-agency Relations, Agency Independence and Accountability*, 7 EUR. J. LEGAL STUD. 68, 68 (2015).

in Part III that regulatory burdens can be alleviated, perhaps unintentionally, by an unlimited CBDE policy which we support in Part II.

The key burdens of the iron law of financial regulation have brought about transformation for many banks in terms of their traditional business model of relationship-based lending which remains on banks' balance sheets. Banks have been able to "create private money"[44] based on the full intermediation of retail deposits[45] by evaluating risk using informational depths that can only be obtained via relationship-based banking. During the global financial crisis, we saw that many banks had compromised on their informational expertise in a rush to compete for risk-taking, hence mispricing risk.[46] Instead of rebuilding and reinforcing banks' informational expertise in order to return to sound relationship-based lending, the iron law of financial regulation reflects a distrust in banks' informational capacities and provides for a prescriptive regime for risk calculation[47] in order to prevent deviant behavior in risk-pricing. These prescriptions build in conservatism and therefore make it costly for banks to engage in the extents of relationship-based lending to which they were once used. Such regulation is not unwarranted as pre-crisis regulatory cost for risk-taking had likely been too low.[48] Moreover the regulatory model is highly premised on the need to protect the social utility of banks in relation to their provision of necessary deposit services for the vast public.[49] In many developed financial jurisdictions including the

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44 *See generally* Douglas W. Diamond & Raghuram G. Rajan, *Liquidity Risk, Liquidity Creation, and Financial Fragility: A Theory of Banking*, 109 J. POL. ECON. 287, 287-88 (2001) (explaining how banks finance entrepreneurs by lending, therefore creating private money); *see also* Michael McLeay et al., *Money Creation in the Modern Economy*, 2014 Q1 BANK ENG. Q. BULL. 14 (2014) (modern discussions on the liberal creation of money by banks).

45 As well as relying on wholesale sector funding. *See* Stefan Gissler & Borghan Narajabad, *Supply of Private Safe Assets: Interplay of Shadow and Traditional Banks* (Feb. 28, 2018), https://ssrn.com/abstract=3132058 [https://perma.cc/E5KT-YDT7].

46 Diligence and informational failures regarding collateralized debt obligations which experienced a market crash during the global financial crisis of 2007-2009 are discussed in Richard E. Mendales, *Collateralized Explosive Devices: Why Securities Regulation Failed to Prevent the CDO Meltdown, and How to Fix it*, 2009 U. ILL. L. REV. 1359, 1361 (2009).

47 CHIU & WILSON, *supra* note 24, at 372-86.

48 ANAT ADMATI & MARTIN HELLWIG, THE BANKERS' NEW CLOTHES ch. 6 (2013).

49 SILVIA MERLER, ECON. GOVERNANCE SUPPORT UNIT, CRITICAL FUNCTIONS AND

EU, the provision of "store of value" custodial services for money, i.e., the deposit-taking service, is privatized,[50] hence the pressing need to ensure that banks' full intermediation of deposits in its financial activities are credibly regulated.

Liquidity regulation[51] has also been introduced in order to ensure that banks can meet their liabilities without causing disruption, chief of which the withdrawal of retail deposits in an unexpected crisis. Liquidity regulation now incentivizes banks to hoard high quality liquid assets such as well-rated sovereign and corporate bonds,[52] and in this manner skews banks' preferences against illiquid and risky balance-sheet based activities[53] such as relationship-based lending to small and medium sized enterprises.[54] The overall picture is a move, particularly in European banks,[55] away from balance sheet-based activity which also prompts them to move away from the full intermediation model of transforming deposits into relationship-based loans. In this manner, there is less incentive to take deposits to provide the funding base for relationship-based lending.[56]

Although relationship-based lending can be susceptible to cronyistic favoring of clients, and can result in banks holding non-

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PUBLIC INTEREST IN BANKING SERVICES: NEED FOR CLARIFICATION? § 4.1 (2017).

50 *See* MARY MELLOR, THE FUTURE OF MONEY: FROM FINANCIAL CRISIS TO PUBLIC RESOURCE 31-58 (2010); *see also* Helmut Siekmann, *Deposit Banking and the Use of Monetary Instruments*, *in* MONEY IN THE WESTERN LEGAL TRADITION 489-531 (David Fox & Wolfgang Ernst eds., 2016).

51 Such as the liquidity coverage ratio that imposes on banks obligations to maintain liquid assets sufficient for thirty days' expenses in a stressed scenario. *See* BANK FOR INT'L SETTLEMENTS, BASEL III: A GLOBAL REGULATORY FRAMEWORK FOR MORE RESILIENT BANKS AND BANKING SYSTEMS 4 (2011).

52 *LCR30—High Quality Liquid Assets*, BANK FOR INT'L SETTLEMENTS (Dec. 31, 2019), https://www.bis.org/basel_framework/chapter/LCR/30.htm?tldate=20191231&inforce=20191215 [https://perma.cc/8UXZ-DN5T].

53 Jean Dermine, *Bank Regulations After the Global Financial Crisis: Good Intentions and Unintended Evil*, 19 EUR. FIN. MGMT. 658, 658-74 (2013).

54 Yiannis Anagnostopoulos & Jackie Kabeega, *Insider Perspectives on European Banking Challenges in the Postcrisis Regulation Environment*, 20 J. BANKING REGUL. 136, 136-158 (2019); Elisabeth Paulet, *Bank Liquidity Regulation: Impact on Their Business Model and on Entrepreneurial Finance in Europe*, 27 STRATEGIC CHANGE 339, 339-50 (2018); Elisabeth Paulet et al., *The SME Struggle for Financing: A Clampdown in European Banks Post-Crisis* 35 J. BUS. STRATEGY 36, 36-45 (2014).

55 *See* EURO. CENT. BANK, FINANCIAL STABILITY REVIEW 70-72 (2014).

56 *See infra* Section I.B.

performing loans against which they do not enforce,[57] the benefits of relationship-based lending include access to finance for business entities such as small and medium-sized enterprises which do not have many alternatives in terms of avenues in capital markets.[58] Empirical research has documented that relationship-based lending benefits small and medium-sized enterprises in terms of longer-term financing needs,[59] and small and medium-sized businesses can often access credit with the same lender more readily when unexpected needs arise.[60]

Prescriptive prudential regulations have played a significant part in banks' retreat from relationship-based lending. The extensiveness of such regulations can be observed in the EU in its levels of primary, secondary and tertiary regulations.[61] Further, the supervisory rigor of the ECB for systemically important Euro-area banks[62] reinforces banks' aversion to non-compliance. The raison d'être of the Banking Union, which is to mitigate excessive levels of lending such as sovereign funding[63] and propping up zombie national companies or industries[64] also puts pressure on banks to move away from traditional business models in search of new avenues of revenue and profit. Banks have been scrutinized for their

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57 Andreas Kokkinis & Andrea Miglionico, *The Role of Bank Management in the EU Resolution Regime for NPLs*, 6 J. FIN. REG. 204, 204 (2020).

58 Timo Baas & Mechthild Schrooten, *Relationship Banking and SMEs: A Theoretical Analysis*, 27 SMALL BUS. ECON. 127, 127 (2006); Janne Peltoniemi, *The Benefits of Relationship Banking: Evidence from Small Business Financing in Finland*, 31 J. FIN. SERVS. RSCH. 153, 153 (2007); Marko Jakšič & Matej Marinč, *Relationship Banking and Information Technology: The Role of Artificial Intelligence and FinTech*, 21 RISK MGMT. 1, 1 (2019).

59 Jakšič & Marinč, *supra* note 58.

60 Atreya Chakraborty, *The Importance of Being Known: Relationship Banking and Credit Limits*, 49 Q. J. FIN. & ACCT. 27, 27 (2010); Rebel A. Cole, *The Importance of Relationships to the Availability of Credit* 22 J. BANKING & FIN. 959, 959 (1998).

61 Wymeersch, *supra* note 25, at 1.

62 *See, e.g.*, GEHRIG ET AL., EUROPEAN BANKING SUPERVISION: THE FIRST EIGHTEEN MONTHS 4-5 (Dirk Schoenmaker & Nicholas Véron eds., 2016) (describing the toughness of the ECB as a bank supervisor).

63 *See* Daniel Gros, *Banking Union with a Sovereign Virus: The Self-serving Treatment of Sovereign Debt*, 48 INTERECONOMICS 93, 93 (2013).

64 Manuela Storz et al., *Do We Want These Two to Tango? On Zombie Firms and Stressed Banks in Europe* (Eur. Cent. Bank, Working Paper 2104, 2017) (highlighting the persistent problem of financing zombie firms, but the working paper indicates that arguably the ECB's supervisory attention is tuned to this issue).

resilience on a regular basis,[65] bringing about possibilities for invoking their resolution,[66] overall resulting in a shrinking of the size of the banking sector. As will be discussed in Section I.B *infra*, loose monetary policy has failed to overturn the trend of lending decline as such policy also does not incentivize banks with low interest revenues. Many banks have been gradually transforming away from relationship-based lending on their balance sheets and have increasingly engaged with the capital markets to intermediate finance in new ways.[67] This transformation is not altogether sub-optimal, but what is sub-optimal is that it is driven primarily by regulatory cost, therefore a form of distorted market behavior brought about by regulation. Credit intermediation in capital markets benefits from dispersion of risk held by investors, and can be optimal when borrower information is standardized, susceptible to regular disclosure and pricing adjustments by markets. However, where information is costly to produce or disseminate, or cannot be easily standardized, capital markets may not be the optimal venue for such credit intermediation.[68] Banks have developed informational expertise and due diligence in executing their business models for relationship-based lending, and such a form of financing is not necessarily completely substitutable by capital markets whose information standardizations are less tailor-made[69]

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65 Regular stress-testing of banks takes place in the EU. For example, the European Banking Authority carries out bi-annual stress-tests. *EU-wide Stress Testing*, EUR. BANKING AUTH., https://www.eba.europa.eu/risk-analysis-and-data/eu-wide-stress-testing [https://perma.cc/89RG-YY4G] (last visited Nov. 28, 2022). The ECB also carries out annual stress tests as part of Supervisory Review and Evaluation Process. *SREP 2019*, EUR. CENT. BANK, https://www.bankingsupervision.europa.eu/banking/srep/2019/html/index.en.html [https://perma.cc/CH2P-755K] (last visited Nov. 28, 2022).

66 For example, the resolution of Portuguese bank Banco Popular which fared close in the EBA's 2016 stress test and was ultimately put into resolution the following year. *See* B. MESNARD ET AL., EUR. PARLIAMENT, THE RESOLUTION OF BANCO POPULAR 1 (2017).

67 *See, e.g.*, *European ABS Market: Signs of Recovery, Growth and Evolution*, BNY MELLON (June 2021), https://www.bnymellon.com/emea/en/solutions/features/european-abs-market-signs-of-recovery-growth-and-evolution.html [https://perma.cc/7U6A-AUXP]; Magdalena Stoklosa, *The Market Is Overlooking the Change in Europe's Investment Banks*, FIN. TIMES (Aug. 6, 2021), https://www.ft.com/content/7cc43177-2add-447a-bccd-29b33c4253e0 [https://perma.cc/X2ZE-3ZVB].

68 Mendales, *supra* note 46 (showing the limitations of capital markets-based credit intermediation for opaque loan-based assets).

69 For example, capital markets products such as equity, debt, and securitized assets are subject to standardized disclosures. Commission Delegated Regulation 2019/980, art. 42, 2019 O.J. (L 166) 26, 43 (EU).

and where incentives may be shorter-term in nature.[70] There is therefore still an important role for relationship-based lending. In this credit gap, however, new non-bank entities have arisen, such as "buy now, pay later" companies that intermediate credit risks in new ways,[71] and peer-to-peer lending platforms.[72] They are regulated differently[73] and overall contribute to the question of regulatory coherence or arbitrage,[74] sharpening the focus on how post-crisis bank regulation has adversely affected the banking business. There is a need for policymakers to take stock of how financial intermediaries including banks are meeting credit intermediation needs and how regulation should be revisited to ensure that markets are regulated coherently, while also promoting innovation and competitive businesses.

B. Erosion of the Typical Funding Model of Commercial Banks

A significant change in banks' sources of funding is linked to banks' retreat from traditional relationship-based lending. Banks typically fund their relationship-based lending by deposit-taking.

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70 *See Short Termism*, CFA INST., https://www.cfainstitute.org/en/advocacy/issues/short-termism [https://perma.cc/2VZJ-J3T3] (last visited Nov. 28, 2022). There is, however, research disputing that European capital markets are necessarily short-termist in nature. *See* Małgorzata Janicka et al., *Does Short-termism Influence the Market Value of Companies? Evidence from EU Countries*, 13 J. RISK & FIN. MGMT. 272, 288 (2020).

71 Nikita Divissenko, *Buy Now, Pay Later: The Role of EU Regulation in Shaping the "New Normal,"* EUIDEAS (Dec. 17, 2020), https://euideas.eui.eu/2020/12/17/buy-now-pay-later-the-role-of-eu-regulation-in-shaping-the-new-normal/ [https://perma.cc/9WBJ-2QV4].

72 *See* Vincenzo Bavoso, *Financial Intermediation in the Age of FinTech: P2P Lending and the Reinvention of Banking*, 42 OXFORD J. LEGAL STUD. 48, 48-75 (2021).

73 Buy now, pay later is not comprehensively regulated at the EU level, but consider the relatively piecemeal approach to regulation in the UK and the Financial Conduct Authority (FCA) while avoiding the full conduct of business regulation applicable to credit entities. *See* FIN. CONDUCT AUTH., PS19/17: BUY NOW PAY LATER OFFERS — FEEDBACK ON CP18/43 AND FINAL RULES(2019); *FCA Secures Contract Changes for Buy-now-pay-later Customers*, FIN. CONDUCT AUTH. (Feb. 14, 2022), https://www.fca.org.uk/news/press-releases/fca-secures-contract-changes-buy-now-pay-later-customers [https://perma.cc/SRB3-JUKA]. Peer-to-peer lending is regulated via a lighter-touch approach that centers on platforms' obligations and more self-help in investor protection. *See* Council Regulation 2020/1503, 2020 O.J. (L 347) (EU).

74 Heikki Marjosola, *The Problem of Regulatory Arbitrage: A Transaction Cost Economics Perspective*, 15 REGUL. & GOVERNANCE 388, 390 (2019).

Conventionally, the cheapest sources of debt financing of commercial banks are deposits from their retail customers.[75] Retail customers seek a reliable store of value option and access to electronic payment systems, and deposit accounts have long been their preferred—if not only—option to achieve these purposes.[76]

The above "win-win" situation has long provided retail customers with necessary store of value as well as access to key financial services such as payments, and banks with a cheap and available source of funding. However, as banks engage in gradual business transformation in response to the iron law of financial regulation, a decoupling has taken place in the Euro-area between the provision of necessary services to the retail sector and banks' financial intermediation model. Although the iron law of financial regulation disincentivizes relationship-based lending that creates assets on banks' balance sheets, banks have remained the engines of finance in the bank-based economies of the Euro-area as capital markets are not sufficiently well-developed to replace banks in their role of chief financiers of the Euro-area economies.[77] This explains why the Eurosystem has maintained a monetary policy that continues to incentivize banks to lend although such (excessive) lending clashes with their needs to recover from the impact that the global financial crisis and euro-area sovereign debt crisis has had on their financial soundness and their business opportunities.[78]

In order to facilitate bank lending, the Eurosystem provides loans to commercial banks without limits to lending volumes and almost for free.[79] Only the principle of adequate collateralization provides a factual limit to the amounts that commercial banks can borrow.[80] At the same time, the Eurosystem charged punitive rates

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75 JOSÉ GABILONDO, BANK FUNDING LIQUIDITY AND CAPITAL ADEQUACY: A LAW AND FINANCE APPROACH 26-61 (2016) (outlining basic principles of the banking business).

76 *Id*.

77 EUR. COMM'N, BUILDING A CAPITAL MARKETS UNION 2-8 (2015).

78 *See* Philip R. Lane, *The European Sovereign Debt Crisis*, 26 J. ECON. PERSP. 49, 65 (2012).

79 Christian Hofmann, *Central Banks and Their Limits in a Pandemic*, *in* COVID-19 IN ASIA: LAW AND POLICY CONTEXTS 97-112 (Victor V. Ramraj ed., 2021) (illustrating accessibility of Eurosystem lending before and at the outbreak of the pandemic).

80 *See generally* GABILONDO, *supra* note 75, at 26-61 (principles of collateralization of central bank lending in general); RESEARCH HANDBOOK ON CRISIS MANAGEMENT IN THE BANKING SECTOR 24-41 (Matthias Haentjens & Bob Wessels eds., 2015) (central banks and their lending roles and collateral markets); European Central Bank Guideline

for banks' excess reserves for years and thereby made retail deposits an unattractive source of funding above certain levels.[81] The idea behind negative interest charged for excess reserves is clear; Commercial banks are not meant to stockpile the liquidity to which they have cheap or even free access, but should channel it into the economy, predominantly by way of lending to their corporate and retail customers.[82] The Eurosystem wants commercial banks to invest their excess reserves in sovereign bonds, which they use as collateral for more borrowing from central banks to finance their lending to all parts of the economy.[83] The Eurosystem therefore charged commercial banks a punitive interest rate of -0.5% for its overnight deposit facility from September 2019 to July 2022 (and negative interest from 2014 to 2022).[84] This contrasts with central banks like the Bank of England and the Federal Reserve System which have decided against such a move and kept their rates at or above zero.[85] However, commercial banks have not been able to

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2011/817, 2011 O.J. (L 331) 1 (EU) (eligibility of counterparties in the Eurosystem). For eligibility of collateral, the ECB establishes, maintains and publishes a list of eligible assets in accordance with the criteria specified in the "general" and "temporary" framework guidelines. *See* EUR-LEX, https://www.ecb.europa.eu/ecb/legal/1002/1014/html/index-tabs.en.html#gf [https://perma.cc/569D-QL65] (last visited Nov. 28, 2022).

81 *See Key ECB Interest Rates*, EUR. CENT. BANK, https://www.ecb.europa.eu/stats/policy_and_exchange_rates/key_ecb_interest_rates/html/index.en.html [https://perma.cc/HN4X-ZF3J] (last visited Nov. 28, 2022) (portraying current and past interest rates of the Eurosystem). In July 2022, the ECB raised the interest rate for excess reserves to 0%, but the practice of banks to charge their customers punitive interest rates on their deposits has not significantly changed since, and the underlying structural problems in the Euro-area remain, which supports the presumption that the ECB will return to its negative interest practice as soon as inflation pressures subside. *See* Press Release, Eur. Cent. Bank, Monetary Policy Decisions (July 21, 2022), https://www.ecb.europa.eu/press/pr/date/2022/html/ecb.mp220721~53e5bdd317.en.html [https://perma.cc/XL2L-ASU2] (showing that the ECB raised the interest rate for excess reserves to 0%).

82 Isabel Schnabel, *Going Negative: The ECB's Experience*, EUR. CENT. BANK (Aug. 26, 2020), https://www.ecb.europa.eu/press/key/date/2020/html/ecb.sp200826~77ce66626c.en.html [https://perma.cc/MY8T-7S6M].

83 *Id.*

84 *Key ECB Interest Rates*, *supra* note 81 (displaying interest rates of the Eurosystem).

85 *See What Are Negative Interest Rates, and How Would They Affect Me?*, BANK OF ENG., https://www.bankofengland.co.uk/knowledgebank/what-are-negative-interest-rates [https://perma.cc/3LUA-FK7P] (last visited Nov. 28, 2022) (showing that the Bank of England has never set a negative interest rate); *see also* Adrian Ng, *Negative Interest Rate*

make good use of their excess liquidity due to being hampered by regulatory demands in relation to capital levels, hence leading to their low profitability and exacerbating their structural weaknesses.[86] This lack of business opportunity contrasts with the massive increase of liquidity in Euro-area financial markets driven by the Eurosystem's asset purchasing programs,[87] which have dramatically inflated these central banks' balance sheets and expanded excess reserves.[88]

Overall, we do not observe banks rejuvenating and transforming relationship-based lending and becoming profitable again.[89] Instead, data shows that the profitability of commercial banks declines the longer negative interest exists.[90] In the Euro-area, the situation is exacerbated by steady growth of deposit liabilities owed to non-banks from 2008 to 2020.[91] Lending has grown, too, but less than deposit liabilities, reflecting a funding surplus.[92] In 2020, deposit liabilities of commercial banks in the Euro-area alone amounted to EUR 13.4 trillion compared with aggregate loan amounts of EUR

Policy in the U.S.—What We Currently Know, CHATHAM FIN., https://www.chathamfinancial.com/insights/negative-interest-rate-policy-in-the-us[https://perma.cc/DJT2-9QFH] (last visited Nov. 28, 2022) (showing that the U.S. Federal Reserve Board has never set a negative interest rate).

86 Jack Ewing, *A Lack of Lending at European Banks Increases the Fear of Stagnation*, N.Y. TIMES (Sept. 22, 2011), https://www.nytimes.com/2011/09/23/business/global/financing-drought-for-european-banks-heightens-fears.html [https://perma.cc/AJ42-VV2U]; *see also Aim for Revival, Not Just Survival—European Banking Outlook 2020*, OLIVER WYMAN, https://www.oliverwyman.com/our-expertise/insights/2020/jul/european-banking-sector-outlook-2020.html [https://perma.cc/N5NG-8V4V] (last visited Nov. 28, 2022) (providing a nearer update and cautious reporting on the European banking sector outlook).

87 *See* Christian Hofmann, *A Legal Analysis of the Euro Zone Crisis*, 18 FORDHAM J. CORP. FIN. L. 519, 519-64 (2013) (explaining these purchasing programs); *see also* Hofmann, *supra* note 79, at 97-112 (providing the most recent set of measures in response to the COVID-19 pandemic).

88 GRÉGORY CLAEYS, EUR. PARLIAMENT, WHAT ARE THE EFFECTS OF THE ECB'S NEGATIVE INTEREST RATE POLICY? 15-22 (2021).

89 *E.g.*, Vítor Constâncio, *Challenges Faced by the European Banking Sector*, EUR. CENT. BANK (June 14, 2017), https://www.ecb.europa.eu/press/key/date/2017/html/ecb.sp170614.en.html [https://perma.cc/55HT-4W8C].

90 CLAEYS, *supra* note 88, at 22.

91 *See* Hossein Nabilou, *Testing the Waters of the Rubicon: The European Central Bank and Central Bank Digital Currencies*, 21 J. BANKING REGUL. 299, 305 (2020).

92 SARAVIA, *supra* note 28, ch. 3.

7.2 trillion in the entire EU.[93] This growth in deposits is driven by households and non-financial corporations,[94] and the high influx of deposits explains why ratios of deposit liabilities owed to households and non-financial corporations to total bank assets have also grown constantly from 2008 to 2020.[95]

As a result, commercial banks in some Euro-area member states, especially in Germany, perceive non-bank deposits as a burden.[96] What used to be perceived as the virtue of retail funding has, in our view, turned into an expensive vice in the recent monetary policy environment. Retail deposits are a reliable constant in commercial banks' financial planning because retail depositors neither terminate their perennial bank relations nor find better store of value opportunities easily.[97] Non-bank deposits are therefore all but impossible to terminate when the banks' demand disappears.

Whereas most funding sources, especially wholesale lending and central bank loans, allow banks to adjust their borrowings swiftly because they are (relatively) short-term, punitive interest charged on excess reserves weighs heavily on banks' profits when non-bank deposits are sticky.[98] Deposits thereby become an unwelcome burden to banks, especially those which banks owe to individuals who shy away from fee-generating investments and instead leave large amounts of money sitting idly in readily accessible cash deposit accounts. In sum, losses for Euro-area banks result from the undesirable situation that the amounts stored in non-bank deposit accounts have starkly exceeded banks' financing needs since the Eurosystem's negative interest policies started.

These incurred expenses for excess reserves exacerbate the difficulties of ailing Euro-area banks. European banks were excessively leveraged pre-crisis, exposing them to insolvency risks during the global financial crisis and subsequent Euro-area

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93 *Id*.

94 SARAVIA, *supra* note 28, at 15-17.

95 *Id*. at 20.

96 *See* Landgericht Tübingen [District Court Tübingen] Jan. 26, 2018, 4 O 187/17 (Ger.) (illustrating disincentivizing measures applied by German banks to discourage high levels of deposits).

97 *See* Nabilou, *supra* note 91, at 305 (suggesting that retail customers are less likely to run than professional holders of commercial bank debt in a crisis).

98 *See* Hofmann, *supra* note 87 (showing negative interest rate charged by Eurosystem for banks' excess reserves).

sovereign debt crisis.[99] Although the post-crisis regulatory reforms intended to return them to strength and credibility, the recovery of European banks has been slow compared with their American counterparts.[100] Many Euro-area banks with existing non-performing loans are too weak to compete in sluggish lending markets and are additionally penalized by negative interest charged by central banks for excess reserves forced on the banks by sticky depositors.[101] The outlook is uncertain as to how they can break free from this vicious cycle and return to profitability.[102]

The Eurosystem has tried to reduce the financial burden from negative interest by exempting sixfold amounts of required reserves from negative interest payments.[103] However, this change has led to more uneven concentrations of cost in the Euro-area. Commercial banks in Germany, France, the Netherlands, Luxembourg and Finland pay for the vast majority of these negative interest expenses as their share of commercial deposits is higher relative to the rest of the Euro-area.[104] The foreign trade partners of the Eurosystem's asset purchasers mainly deposit their euro liquidity mostly with commercial banks in these five countries.[105] Since such negatively affected banks try to pass on their expenses, interest rates above zero for sight deposits are practically nonexistent in the Euro-area, and even for term deposits, interest rates hover around 0%.[106]

A comparison of the Euro-area's two largest economies shows that German commercial banks fare badly under their double strain

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99 *Timeline: The Unfolding Eurozone Crisis*, BBC NEWS, https://www.bbc.com/news/business-13856580 [https://perma.cc/TN69-LFB8] (last visited Nov. 28, 2022).

100 *See Return on Average Equity for All U.S. Banks*, *supra* note 32.

101 *See* Hofmann, *supra* note 87.

102 Luis de Guindos, *Euro Area Banks: The Profitability Challenge*, EUR. CENT. BANK (June 25, 2019) https://www.ecb.europa.eu/press/key/date/2019/html/ecb.sp190625~6d33411cff.en.html [https://perma.cc/294E-ZWYP]; Silvia Amaro, *ECB Warns Bank Profits Will Remain Weak Next Year*, CNBC (Nov. 25, 2020), https://www.cnbc.com/2020/11/25/ecb-bank-profits-will-remain-weak-until-2022.html [https://perma.cc/LZ72-S8B3]; Schnabel, *supra* note 82.

103 CLAEYS, *supra* note 88, at 22.

104 *Id.*

105 *Id.* at 16.

106 *See Bank Interest Rates—Deposits*, EURO AREA STAT., https://www.euro-area-statistics.org/bank-interest-rates-deposits?cr=lux&lg=en&page=0&template=1 [https://perma.cc/2FSR-EVA9] (last visited Nov. 28, 2022) (providing updated data on European bank interest rates for deposits).

from punitive interest from central banks and liquidity oversupply from depositors, whereas French banks manage better.[107] Studies have shown that commercial banks with large fractions of deposits relative to their overall liabilities have increased fees more strongly than their peers with lower fractions.[108] That explains why German banks especially engage in attempts to rid themselves of deposits from their corporate and retail customers.

Retail customers looking for safe store of value options face few choices. Money market rates were consistently negative in Germany in 2021,[109] also exacerbating the difficulty for banks to profitably use their excess liquidity. In Germany in particular, high levels of deposit-saving rates make it challenging for banks to meet customers' demands. Reasons for German savers' preference for holding cash in deposit accounts are manifold, and among them are Germany's low rate of home ownership which is the second lowest in all Organisation for Economic Co-operation and Development (OECD) countries; the reluctance of German households to invest in securities, and their traditional faith in the "virtue of saving."[110] In 2021, Germans owned over EUR 7 trillion in financial assets and showed a remarkable interest in traditional deposit accounts.[111] According to surveys,[112] 62.5% of all German households use ordinary deposit accounts for store of value purposes, a record high and significantly higher than the 38.2% in 2011. A record high of 30% of households kept parts or all of their savings at home in cash

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107 CLAEYS, *supra* note 88, at 22.

108 PIETRO GRANDI & MARIANNE GUILLE, THE UPSIDE DOWN: BANKS, DEPOSITS AND NEGATIVE RATES 2 (2021).

109 *Germany Short Term Interest Rate*, CEIC DATA, https://www.ceicdata.com/en/indicator/germany/short-term-interest-rate [https://perma.cc/XC96-B99T] (last visited Nov. 28, 2022).

110 *See* Leo Kass et al., *Reasons for the Low Homeownership Rate in Germany*, DEUTSCHE BUNDESBANK (Jan. 14, 2020), https://www.bundesbank.de/en/publications/research/research-brief/2020-30-homeownership-822176 [https://perma.cc/2J6S-7DU9] (analyzing the issue of low homeownership).

111 *Private Households: Germans Hoard Over 7 Trillion Euros in Financial Assets*, LTD. TIMES (July 16, 2021), https://newsrnd.com/news/2021-07-16-private-households--germans-hoard-over-7-trillion-euros-in-financial-assets.SkhTofkR_.html [https://perma.cc/JA92-JTY5].

112 *See* Von Lothar Gries, *Sparer Verlieren Milliardenvermögen*, TAGESSCHAU (Oct. 29, 2021), https://www.tagesschau.de/wirtschaft/finanzen/sparer-geldvermoegen-inflation-nullzins-103.html [https://perma.cc/XM2X-TU8L].

to avoid negative interest, up 10% from 2020.[113] In terms of absolute amounts, the survey found that one third of Germans store more than EUR 5,000 in cash at home or in deposit accounts, and 4% store amounts above EUR 50,000.[114] In total, 28% of financial assets were held in cash or ordinary deposit accounts in 2021, an all-time high.[115]

In response to their massive excess reserves, many German banks apply some form of punitive mechanism to deposits.[116] Service fees are generally charged for newly opened accounts, and negative interest is imposed on amounts exceeding certain thresholds.[117] These thresholds have been lowered several times and now stand at amounts that affect the vast majority of average retail depositors, e.g., to thresholds as low as EUR 25,000 of aggregate amounts held with a bank.[118] The negative interest oftentimes comes in addition to servicing fees for accounts and cards which were uncommon until a few years ago. Whether these practices are compatible with German law has not been decided by Germany's higher courts, but customers have been successful in courts of first instance. One court declared negative interest incompatible with the concept of a deposit.[119] Bank customers also litigated successfully against their banks' attempts to extend the negative interest to pre-existing accounts.[120] It shows what media reports have been reflecting for a long time: deep-running discontent among banks and the public in Germany about the effects of the Eurosystem's negative interest policy.

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113 *Id*.

114 *Id*.

115 *Id*.

116 Kevin Helms, *300 Banks in Germany Charge Negative Interest Rates Including Deutsche Bank, Commerzbank, ING*, BITCOIN.COM (Nov. 15, 2020), https://news.bitcoin.com/300-banks-germany-negative-interest-rates-deutsche-bank-commerzbank-ing/ [https://perma.cc/2DRD-ZV2X]; *German Banks Increasingly Charge Negative Interest Rates*, XINHUA NEWS AGENCY (June 30, 2021), http://www.xinhuanet.com/english/europe/2021-06/30/c_1310036507.htm [https://perma.cc/4FNE-B753].

117 *German Banks Increasingly Charge Negative Interest Rates*, *supra* note 116.

118 *See* DEUTSCHE KREDITBANK (DKB), https://bank.dkb.de/privatkunden/girokonto?wt_mc=pk.cash.hp.bed.g.icon-70 [https://perma.cc/7PBC-RYY9] (last visited Nov. 28, 2022) (stating DKB charges 0.5% to all amounts exceeding EUR 25,000, calculated on an aggregate basis, to all customers who opened their accounts after October 2021).

119 Landgericht Berlin [District Court Berlin] Oct. 28, 2021, Az. 16 O 43/21 (Ger.).

120 *See, e.g.*,Landgericht Tübingen, *supra* note 96.

In the rest of the Euro-area, the developments are very similar. In the Netherlands, banks have repeatedly lowered the thresholds above which they charge punitive interest, and negative interest currently applies to amounts above EUR 100,000.[121] In Spain, some banks charge negative interest of 0.3% for deposits above EUR 100,000.[122] In Belgium, banks have recently lowered the threshold for punitive interest of -0.5% from EUR 1 million to 250,000.[123]

The situation is not limited to the Euro-area or even the EU. The Swiss National Bank has charged negative interest for excess deposits since 2015, and Swiss banks have long overcome their initial reluctance to extend these costs to their customers.[124] For example, UBS charges -0.75% to amounts above CHF 250,000, PostFinance to those above CHF 100,000, and some banks decide about thresholds on a case-by-case basis.[125] As of 2021, only 11%

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121 *See* Hans Sjouke Koopal, *Negative Interest Threshold to Be Lowered to EUR 100,000*, ABN AMRO (Oct. 19, 2021), https://www.abnamro.com/clearing/en/news/negative-interest-threshold-to-be-lowered-to-eur-100-000 [https://perma.cc/LB69-Z42P]; Vanya Damyanova, *German, Dutch Banks Bear the Brunt of 7 Years of Negative Rates—ING Study*, S&P GLOB. (Jul. 1, 2021), https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/german-dutch-banks-bear-the-brunt-of-7-years-of-negative-rates-8211-ing-study-65216170 [https://perma.cc/D53M-CBFV]; *Low Interest Rates Put Pressure on Banks' Interest Margin*, DENEDERLANDSCHEBANK (Apr. 26, 2022), https://www.dnb.nl/en/general-news/dnbulletins-2021/low-interest-rates-put-pressure-on-banks-interest-margin/ [https://perma.cc/M3G7-Z3DD].

122 *See* Jennifer Laidlaw, *Spain's BBVA to Charge for Deposits of More Than €100,000—Europa Press*, S&P GLOB. (Jan. 11, 2021), https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/spain-s-bbva-to-charge-for-deposits-of-more-than-8364-100-000-8211-europa-press-62058454 [https://perma.cc/HX4F-JXAR].

123 *See ING Belgium Revises Pricing to Reflect Market Conditions and Continues to Invest in Digital Value-added Services for Its Customers*, ING (Apr. 20, 2021), https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/spain-s-bbva-to-charge-for-deposits-of-more-than-8364-100-000-8211-europa-press-62058454 [https://perma.cc/7LHZ-TXJ4].

124 *See* BANK FOR INT'L SETTLEMENTS, REP. NO. 1, CENTRAL BANK DIGITAL CURRENCIES: FOUNDATIONAL PRINCIPLES AND CORE FEATURES 10 (2020); Christian Hofmann, *Central Bank Digital Currency: Why Some Markets Need It and Others Do Not*, CAP. MKTS. L.J. 15-16 (forthcoming 2023).

125 Benjamin Manz, *Swiss Banks with Negative Interest Rates*, MONEYLAND.CH (Oct. 5, 2021), https://www.moneyland.ch/en/swiss-banks-with-negative-interest-rates [https://perma.cc/HGK6-GAPC]; *Negative Interest: Perfect Storm Ahead*, FINEWS.COM (Nov. 7, 2019), https://www.finews.com/news/english-news/38737-negative-interest-perfect-storm-ahead [https://perma.cc/5948-Q8NC]; *Negative Interest Continues to Hit Banks—and Customers*, SWI (Apr. 22, 2021), https://www.swissinfo.ch/eng/negative-interest-continues-to-hit-banks---and-customers/46557222 [https://perma.cc/W457-VRYM]; Matthew Allen, *Bank Savers Feel*

of banks in Switzerland categorically rule out passing on negative interest rates to private clients, a significant drop from the 21% in 2020 and 70% in 2016.[126]

There is an evident trend in the Euro-area that shows banks' declining ability to provide credit intermediation and increasing reluctance to provide a public good of store of value, especially at high deposit levels. It follows that there is a pressing need for an infallible store of value service for retail customers; from a policy perspective, there is an equally pressing need for a response to the weakness of European banks and a mechanism that facilitates a general rejuvenation of the financial sector and especially banks as healthy providers of financial intermediation. We turn to discuss how the Eurosystem's recent proposal for CBDC may address all these needs and consider the potential of CBDE for bank and financial sector business transformations which can lead to more optimal bank supervision and monetary policy purposes.

II. Mapping the Rationales for a CBDE and Why Unlimited Issuance Is Justified

The Eurosystem has thus far provided a limited set of rationales for introducing the CBDE (discussed in Section II.A *infra*), focusing on the benefits to the public in terms of diversifying payment services systems,[127] while not inducing severe disruption to the banking sector.[128] However, we argue that a focus on a CBDE that "does no harm" to the existing financial landscape[129] as discussed below seems meaningless and is potentially impotent against new challenges for the official monetary system such as

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Sting from Negative Interest Rates, SWI (Dec. 10, 2019), https://www.swissinfo.ch/eng/bank-savers-feel-sting-from-negative-interest-rates/45424320 [https://perma.cc/U6QA-GQ7R].

126 *Swiss Franc Charges for Retail Clients Too?*, FINEWS.COM (Jan. 7, 2021), https://www.finews.com/news/english-news/44470-switzerland-negative-interest-rates-swiss-franc-retail-banking-swiss-national-bank-surcharges-monetary-policy [https://perma.cc/D5EP-UQ5M].

127 *See* EUR. CENT. BANK, *supra* note 2, at 3; Fabio Panetta, *A Digital Euro to Meet the Expectations of Europeans*, EUR. CENT. BANK (Apr. 14, 2021), https://www.ecb.europa.eu/press/key/date/2021/html/ecb.sp210414_1~e76b855b5c.en.html [https://perma.cc/SK4V-5P5P].

128 EUR. CENT. BANK, *supra* note 2, at 3-4; Ulrich Bindseil, *Central Bank Digital Currency: Financial System Implications and Control*, 48 INT'L J. POL. ECON. 303, 307, 329 (2019).

129 *See* BANK FOR INT'L SETTLEMENTS, *supra* note 124, at 10.

those stemming from private cryptocurrency.[130] We argue that the CBDE can be conceived beyond the current limited model that the Eurosystem offers, as it responds to the need for a public good of store of value services, whose provision then paves the way for bank and financial sector intermediation to be potentially rejuvenated in innovative and competitive ways.

We support an unlimited issuance of CBDE by which we argue that the Eurosystem should permit unlimited transfers from bank deposits into CBDE. In this manner, customers can freely decide to what extent they substitute their claims against their banks, which run up against bank insolvency risks,[131] for safe CBDE which are free from any prospect of default. This does not mean *en masse* migration of deposits, as it all depends on whether banks and other financial sector entities perceive the need to attract the retail market.[132] The provision of unlimited CBDE is a channel open to depositors without compulsion, akin to the provision of a public good and an opportunity for banks to re-invent themselves and improve their profitability.

A. The Eurosystem's Stated Rationales for Introducing CBDE and Why They Are Flawed

In 2020, the Eurosystem issued a report[133] on a possible CBDE upon which it carried out a public consultation[134] in relation to the characteristics citizens would want to see in the CBDE. The report clearly set out the rationales for introducing the CBDE as providing choice for retail payments in case of the decline of cash.[135] CBDE is seen as supporting innovations in the digital economy which interface with digital payment, as well as promoting cross-border flows in euros within the Euro-area and internationally.[136] The report sees CBDE as supporting competition in the existing retail

130 Hofmann, *supra* note 124, at 15-16.

131 Although these are guaranteed by deposit guarantee, up to EUR 100,000, the theoretical paradigm of the customer's debt claim against banks remains correct. *See* Council Directive 2014/49, art. 6, 2014 O.J. (L 173) 149, 160 (EU).

132 David Andolfatto, *Assessing the Impact of Central Bank Digital Currency on Private Banks*, 131 ECON. J. 525, 535-38 (2018).

133 EUR. CENT. BANK, *supra* note 2, at 2-8.

134 *See* EUR. CENT. BANK, EUROSYSTEM REPORT ON THE PUBLIC CONSULTATION ON A DIGITAL EURO 2 (2021).

135 *Id*. at 20-21.

136 *Id*. at 22.

payments sector, offering an opportunity for more resilient design[137] and interaction with innovations, while not compromising privacy and personal data protection.[138] Central banks that are members of the Bank for International Settlements (BIS) also support the overall BIS position that CBDC are largely envisaged for retail payments, and providing a new option while not doing harm either to existing payment options nor the roles assumed by private sector financial services.[139] The U.S. Federal Reserve also chiefly sees CBDC as providing a modern and new option in the choice for payment services, but is mindful of the potential disruptions this could cause to the banking sector.[140]

Central banks' motivations for CBDC arguably make very little sense in highly developed financial jurisdictions where private sector provision of financial services is dominant. Taking the Euro-area in particular, the target market for the CBDE, creates levels of high financial inclusion. Residents even have a legal right to a bank account,[141] and cashless payments are efficient in the Euro-area on the national level and especially on a cross-border basis.[142] One of the most convincing motives for the introduction of CBDC, i.e., financial inclusion, is therefore relatively irrelevant for the Euro-area.[143] In their policy statements, the Eurosystem and BIS have

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137 *See* EUR. CENT. BANK, *supra* note 2, at 7 (describing the potential for more resilient design in response to cyberhacking).

138 Panetta, *supra* note 127.

139 BANK FOR INT'L SETTLEMENTS, *supra* note 124, at 10-11; BANK FOR INT'L SETTLEMENTS, ANNUAL ECONOMIC REPORT 65 (2021).

140 BD. OF GOVERNORS, FED. RSRV. SYS., MONEY AND PAYMENTS: THE U.S. DOLLAR IN THE AGE OF DIGITAL TRANSFORMATION 7-9, 17-18 (2022).

141 Council Directive 2014/92, art. 16, 2014 O.J. (L 257) 237-38 (EU).

142 *See* Council Regulation 924/2009, art. 3(1), 2009 O.J. (L 266) 15 (EU) (mandating that cross-border transfers within the EU must not lead to higher charges than domestic transfers); *see also* Council Regulation 2015/751, art. 4, 2015 O.J. (L 123) 11 (EU) (meaning that transfers within the Euro-area can avoid currency conversions, payment cards and e-wallets can be used throughout the EU, and that fees for such cashless transactions are capped and must not be higher for cross-border as compared with domestic payments).

143 BANK FOR INT'L SETTLEMENTS, *supra* note 124, at 5-6 (expounding on the motive and issue of financial inclusion). For financial inclusion and other reasons that motivate central banks to consider CBDC concepts, see Ulrich Bindseil, *Tiered CBDC and the Financial System* 5 (Eur. Cent. Bank, Working Paper No. 2351, 2020); Aleksander Berentsen & Fabian Schär, *The Case for Central Bank Electronic Money and the Non-case for Central Bank Cryptocurrencies*, 100 FED. RSRV. BANK ST. LOUIS REV. 97, 101-04 (2018); Javier Guzmán Calafell, Deputy Governor, Banco de Mex., Some Considerations

adopted the premises of promoting choice, but there seems little market failure and therefore no justification for the immense investment needed for introducing CBDE.

It may be argued that one good reason for introducing CBDE nevertheless remains. The public is disadvantaged in comparison with the financial sector insofar as its only access to central bank money consists of cash whereas commercial banks hold large amounts of central bank money in their reserve accounts.[144] However, central banks in unison emphasize that unlimited access to CBDC can never be granted to the public because the risk of uncontrollable shifts from private money (commercial bank money) into CBDC would come with risks for financial stability.[145] Many commentators[146] have mooted the possibility that any CBDC would provide a channel for migration of deposits in private sector banks to CBDC due to its safety, and this migration may be heightened during perceived financial sector crises. Such migration could cause liquidity squeezes or bank runs which could result in financial stability risks, and the significant loss of deposit funding by banks

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on Central Bank Digital Currencies at the Federal Reserve Bank of St. Louis Symposium: The Next Decade of Finance (July 11, 2019); TOMMASO MANCINI-GRIFFOLI ET AL., INT'L MONETARY FUND, CASTING LIGHT ON CENTRAL BANK DIGITAL CURRENCY 3 (2018); Cecilia Skingsley, *Should the Riksbank Issue E-krona?*, SVERIGES RIKSBANK 6-7 (Nov. 16, 2016), https://www.bis.org/review/r161128a.pdf [https://perma.cc/926P-B623]; Dan Awrey & Kristin van Zwieten, *The Shadow Payment System*, 43 J. CORP. L. 775, 779 (2018) (claiming underbanked areas are a fertile breeding ground for shadow payment systems).

144 For reserve money and central bank money in general, see Will Bateman & Jason Allen, *The Law of Central Bank Reserve Creation*, 85 MOD. L. REV. 401, 404-06 (2021); Seraina N. Grunewald et al., *Digital Euro and ECB Powers*, 58 COMMON MKT. L. REV. 1029 (2021); Michael McLeay et al., *Money in the Modern Economy: An Introduction*, 2014 Q1 BANK ENG. Q. BULL. 4, 11 (2014).

145 Literature points out the high probability of CBDC raising the likelihood of massive runs from private into public money. *See e.g.*, BANK OF INT'L SETTLEMENTS, *supra* note 124, at 8; Yves Mersch, *Digital Base Money: An Assessment from the ECB's Perspective*, EUR. CENT. BANK (Jan. 16, 2017), https://www.ecb.europa.eu/press/key/date/2017/html/sp170116.en.html [https://perma.cc/WT2Z-UTS2]; *see also* EUR. CENT. BANK, *supra* note 2, at 16; Bindseil, *supra* note 143, at 9; Hossein Nabilou, *Testing the Waters of the Rubicon: The European Central Bank and Central Bank Digital Currencies*, 21 J. BANKING REGUL. 299, 308 (2020); Corinne Zellweger-Gutknecht et al., *Digital Euro, Monetary Objects, and Price Stability: A Legal Analysis*, 7 J. FIN. REGUL. 284, 307 (2021).

146 Michael Kumhof & Clare Noone, *Central Bank Digital Currencies—Design Principles and Balance Sheet Implications* (Bank of Eng., Staff Working Paper No. 725, 2018).

is envisaged to adversely affect lending, which is important for the real economy. Hence, options have been proposed by policymakers to mitigate the disintermediation risks such as by imposing "pre-paid" forms of digital currencies,[147] Caps or quotas in CBDC holdings[148] or by remuneration disincentives, such as operating in a tiered manner,[149] in order to discourage large holdings of CBDE, while supporting reasonable levels of holdings for payments and retail level commerce.

However, financial stability risks may be overstated as they assume that deposit funding is highly important to banks and that interest rates would remain low in order to facilitate lending by banks. These "preferred status quo" expectations for banks are already shifting as Part I discussed. If banks' demand for deposit funding is indeed waning, then controlled issuances of CBDE would not meet the public need for the public good of a safe store of value. Furthermore, limitations to the amounts of CBDE held by individuals would in our view unlikely meet any of the plausible objectives for introducing CBDC. Such limited issuance would perhaps cater for a section of young, tech-savvy retail customers who would appreciate the increase in choice of payment options.[150] But this would be a cosmetic outcome which is unlikely to meet the potential challenges central banks face in the developments of private cryptocurrencies and stablecoins.

One of the driving forces for central banks considering CBDC is to promote a superior form of money[151] in the face of the adoption of private alternative monetary systems such as bitcoin[152] and

147 EUR. CENT. BANK, *supra* note 2, at 17-18; Ulrich Bindseil, *Issuing a Digital Euro*, *in* ESCB LEGAL CONFERENCE 2020 172, 172 (2020); Eric Wagner et al., *Preparing Euro Payments for the Future: A Blueprint for a Digital Euro*, 15 J. PAYMENTS STRATEGY & SYS. 165, 180 (2021) (discussing in relation to Sweden).

148 *See* BANK FOR INT'L SETTLEMENTS, *supra* note 124, at 14-15; *see also* MARKUS BRUNNERMEIER & JEAN-PIERRE LANDAU, EUR. PARLIAMENT, THE DIGITAL EURO: POLICY IMPLICATIONS AND PERSPECTIVES 42 (2022).

149 *See* Bindseil, *supra* note 147, at 176.

150 EUR. CENT. BANK, *supra* note 134, at 7 (noting the age distribution of the respondents in ECB exhibits "a skewed bell-shape, with a peak in the 35-54 age range").

151 *See* ANNUAL ECONOMIC REPORT, *supra* note 139, at 65-66 ("CBDCs may give further impetus to innovations that promote the efficiency, convenience and safety of the payment system."); G.A. Walker, *Bigtech, Stabletech, and Libra Coin—New Dawn, New Challenges, New Solutions*, 53 INT'L LAW. 303, 381 (2020).

152 *Bitcoin*, COINMARKETCAP, https://coinmarketcap.com/currencies/bitcoin/ [https://perma.cc/BVB2-96C6] (last visited Nov. 28, 2022) (market capitalization at about

Ethereum.[153] In this manner, the CBDE contributes to protecting the monetary primacy of the euro in face of challenges from private cryptocurrency. As citizens experience the gradual limitation of store of value services provided by the banking sector (as discussed at Part I), they may be forced into unguaranteed financial products that entail capital and liquidity risks. Typical retail-level investments are often low-yield, and high-risk returns are generally limited to privileged investor groups.[154] Hence, retail savers may be tempted by offers stemming from new competition for the financial industry—cryptocurrency- and cryptoasset-services that offer alternative store of value services.[155] Crypto-service providers can transform fiat currency into a range of digital coins or tokens that can be used to access novel economic or financial activities. For example, a fintech can offer the opportunity for customers to exchange cash for their digital tokens based on a value formula, such tokens being used for an Internet of Things economy[156] that facilitates quick access and payment to repeated goods and services in automation mode. Alternative modes of stored value become attractive in situations in which traditional saving accounts no longer yield interest, especially when inflation erodes savings, as is currently the case in the Euro-area.

With the relative ease provided by multinational cryptocurrency exchanges such as Binance, Bitfinex and other venues whose domiciles are even difficult to pin down, there is the option of converting cash into cryptocurrency to participate in the Ethereum economy,[157] which currently hosts the most significant crypto-

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USD 4,000 billion).

153 *Ethereum*, COINMARKETCAP, https://coinmarketcap.com/currencies/ethereum/ [https://perma.cc/5K7N-8LXL] (last visited Nov. 28, 2022) (market capitalization at about USD 216 billion).

154 Private placements of securities, corporate bonds, and securitized assets are exempted, facilitating such private markets not open to retail investors. *See* Council Regulation 2017/1119, art. 1, 2017 O.J. (L 168) 12, 27 (EU) (exempting a variety of offers of securities to the public).

155 *See* Philipp G. Sandner et al., *The Digital Programmable Euro, Libra and CBDC: Implications for European Banks* (July 29, 2020), https://ssrn.com/abstract=3663142 [https://perma.cc/EYZ8-8X3Y]; *see also* BRUNNERMEIER & LANDAU, *supra* note 148, at 17, 19.

156 Alexander Bechtel et al., *The Future of Payments in a DLT-Based European Economy: A Roadmap* 26 (Dec. 18, 2020), https://ssrn.com/abstract=3751204 [https://perma.cc/J32T-EMVV]; *see also* BANK OF ENG., *supra* note 3.

157 *See* IRIS H-Y CHIU, REGULATING THE CRYPTO ECONOMY: BUSINESS

economy[158] in peer-to-peer services and virtual goods that are alternatives to conventional economy counterparts. Opportunities for appreciation in leading cryptocurrencies such as bitcoin and ether could incentivize such migration.[159] More importantly, the development of global stablecoins[160] intended to provide cryptocurrency users with hedging options against their volatility provide great attraction as they can be regarded as stores of value pegged to fiat currency while allowing users the flexibility of participating in cryptocurrency activities and gains.

The market capitalization of major stablecoins such as Tether, USD Coin, and Dai, all referencing the U.S. dollar, have exceeded USD 120 billion,[161] and it is arguable that central banks have been pushed in the direction of developing CBDC to "rival" digital currencies.[162] Limited issuances of CBDC would seem relatively weak in combatting the attractions offered by alternative cryptocurrency and global stablecoins.[163] Despite Meta's Diem project having been wound down,[164] there remains a need to respond to the possibility of Fintech platforms and BigTech companies intruding upon existing systems and institutions with a possibly

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TRANSFORMATIONS AND FINANCIALISATION 80 (2021).

158 *The Rise of the Ethereum Economy*, COINBASE (Mar. 2, 2021), https://www.coinbase.com/learn/market-updates/deep-dive-ethereum-economy [https://perma.cc/A5AR-FFL2].

159 *Win New Customers: Insight into Cryptocurrency Adoption Across Europe and America*, TRIPLEA, https://triple-a.io/white-paper-cryptocurrency-adoption-across-europe-and-america-2021/ [https://perma.cc/T7FD-2D73] (last visited Nov. 28, 2022) (showing that increasing holdings and interest in Europe are detected).

160 Such as Tether, USD Coin and Dai.

161 *See Bitcoin*, *supra* note 152.

162 *See, e.g.*, MONETARY AUTH. OF SING., A RETAIL CENTRAL BANK DIGITAL CURRENCY: ECONOMIC CONSIDERATIONS IN THE SINGAPORE CONTEXT 16-17 (Nov. 2021), https://www.mas.gov.sg/-/media/MAS/EPG/Monographs-or-Information-Paper/A-retail-CBDC---Economic-Considerations-in-the-Singapore-Context.pdf [https://perma.cc/89YZ-WGRV]; *see also* Bruce Mizrach, *Stablecoin Risks Spur Case for Central Bank Digital Currency*, FIN. TIMES (Dec. 6, 2021), https://www.ft.com/content/ff9bcc3d-3583-4f99-8fec-ccfdf8dd3f72 [https://perma.cc/93J3-WXWY].

163 *See* Yuri De Gaia, *3 Reasons Why Stablecoins Will Replace Your Checking Account*, BITCOIN RSRV. J., (May 10, 2020), https://journal.bitcoinreserve.com/3-reasons-why-stablecoins-will-replace-your-checking-account/ [https://perma.cc/WQQ6-KHEK].

164 *See* James Fontanella-Khan et al., *Facebook Gives Up on Crypto Ambitions with Diem Asset Sale*, FIN. TIMES (Jan. 27, 2022), https://www.ft.com/content/e237df96-7cc1-44e5-a92f-96170d34a9bb [https://perma.cc/M65S-HARM].

ready-made private economic and monetary system.[165]

It may be argued that coupled with the regulation of asset-backed stablecoins in the forthcoming European Markets in Crypto-assets Regulation (MiCA),[166] unregulated stablecoins may no longer be as easily and cheaply accessible, and regulation provides a levelling of the playing field to ensure that the financial intermediation performed by stablecoin operators is governed properly and at a cost that no longer disadvantages conventional financial services competitors. However, given the scale of the major stablecoins like Tether, USD Coin, and Dai, it is queried if regulation may not, on the contrary, increase their legitimacy rather than limit their activities by compliance obligations.

B. Countering the Limited Mandate Arguments Against CBDE

Unlimited CBDE may be contrary to the Eurosystem's mandate as the implications of such unlimited CBDE, such as for monetary policy implementation, is beyond the legal framework for the Eurosystem's powers.[167] There are three aspects to this argument that culminate in objecting to an unlimited model for CBDE: one, monetary policy transmission by the Eurosystem is mandated only to be carried out by financial sector institutions; second, it is beyond the Eurosystem's mandate to implement direct monetary policy using CBDE; third, financial disintermediation, which refers to the migration of deposits to CBDE, should be minimized to protect the status quo of banks.

We argue that although the first aspect is at present the prevailing position,[168] it is a sub-optimal position if financial sector intermediation distorts monetary policy transmission, which happens when monetary policy is used as a means to preserve bank stability. This shackling in the Euro-area is reinforced by the ECB's bank supervisory role which we discuss below. In this manner, unshackling would be beneficial, and we see instruments of direct monetary policy as a means to reinforce such unshackling.

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165 *See* Katharina Pistor, *Statehood in the Digital Age*, 27 CONSTELLATIONS 3, 9 (2020); *see also* BRUNNERMEIER & LANDAU, *supra* note 148, at 17, 26.

166 For the regulation in its proposal form, see *Proposal for a Regulation of the European Parliament and of the Council on Markets in Crypto-assets, and Amending Directive (EU) 2019/1937*, COM (2020) 593 final (Sept. 24, 2020).

167 *See* Bateman & Allen, *supra* note 144, at 409.

168 *Id.*

Further, CBDE's role in potentially changing the ways in which banks run their business is not something to be feared in terms of financial disintermediation. Instead, CBDE could promote much needed rejuvenation of bank and financial sector innovation and competitiveness and allow the ECB to take a different view of the needs of bank regulation and supervision. These points are addressed below in turn.

1. Dysfunctional Financial Sector Transmission of Monetary Policy

The lesson learned from the global financial crisis of 2007-2009 is that central banks' well-intentioned low interest rate policy that promotes cheap access to financing and contributes to economic production can result in perverse applications by the financial sector.[169] The financial sector is prone to misallocations in its chase for short term revenues. As a result, wealth creation is concentrated in the hands of financiers who generate fee income[170] and those who enjoy gains in financial asset appreciation.[171] The real economy, however, has become highly leveraged[172] since before the onset of the global financial crisis, while it is uncertain if high levels of debt creation have indeed led to increased productivity of the real economy. Piketty, for example, paints a picture of skepticism in terms of real economic growth in productivity and standards of living and points at increasing inequality in distribution of wealth in developed countries.[173] Debt overhang remains a concern in many jurisdictions after the global financial crisis,[174] while high asset

169 *See* FIN. SERV. AUTH., THE TURNER REVIEW: A REGULATORY RESPONSE TO THE GLOBAL BANKING CRISIS 13-14 (2009).

170 Ismail Erturk & Stefano Solari, *Banks as Continuous Reinvention*, 12 NEW POL. ECON. 369, 380-81 (2007).

171 Rana Foroohar, *The Oldest Asset Class of All Still Dominates Modern Wealth*, FIN. TIMES (Nov. 14, 2021), https://www.ft.com/content/99a3cf9b-0ab8-45b9-bbc5-7e88c08f9ea5 [https://perma.cc/SZT2-XDT7].

172 *See* Adolfo Barajas & Fabio Natalucci, *Confronting the Hazards of Rising Leverage*, IMF BLOG (Mar. 29, 2021), https://blogs.imf.org/2021/03/29/confronting-the-hazards-of-rising-leverage/ [https://perma.cc/WX7E-6PNY].

173 *See* THOMAS PIKETTY, CAPITAL IN THE TWENTY-FIRST CENTURY 86-88 (Arthur Goldhammer trans., Harvard Univ. Press 2014).

174 Alan Ahearne & Guntram B. Wolfe, *The Debt Challenge in Europe* 5 (Bruegel, Working Paper No. 686, 2012). *But see* Alexander Popov et al., *Debt Overhang and Investment Efficiency* 2 (Eur. Cent. Bank, Working Paper No. 2213, 2018).

prices fuel the creation of financial wealth for the few.[175] Against this backdrop, the Eurosystem continues to rely on the financial sector, in particular the banking sector, to transmit the effects of monetary policy. We argue that the principal reasons of unwaveringly loose monetary policy are found in the weakest banks' needs for stability. The same reasons underlie the new role that was created for the ECB in bank supervision.

The need to return the banking sector to credibility after the global financial crisis and sovereign debt crisis in the EU forced policy makers to adopt a pan-European microprudential supervisor for banks in the Euro-area, the Single Supervisory Mechanism (SSM).[176] The SSM is housed under the ECB, as the ECB has "extensive expertise in macro-economic and financial stability issues."[177] This policy arguably reflects: (a) the perspective that bank supervision is complementary to monetary policy objectives,[178] and the ECB taking on bank supervision may be the only way to monitor financial intermediation that takes place in the banking sector; and (b) trust in the ECB as a centralized coordinator of information flows to remedy the hazards of fragmented bank supervision under national regulators.[179] This measure is not uncontroversial in the EU.[180] Hence, although the ECB is tasked

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175 Dietrich Domanski et al., *Wealth Inequality and Monetary Policy*, BIS Q. REV., Mar. 2016, at 45, 56.

176 Consolidated Version of the Treaty on the Functioning of the European Union art. 127(6), Oct. 26, 2012, 2012 O.J. (C 326) [hereinafter TFEU]; *see* Nuno Cassola et al., *The ECB After the Crisis: Existing Synergies Among Monetary Policy, Macroprudential Policies and Banking Supervision* 1, 8 (Eur. Cent. Bank, Occasional Paper Series No. 237, 2019); Tobias Tröger, *The Single Supervisory Mechanism—Panacea or Quack Banking Regulation? Preliminary Assessment of the New Regime for the Prudential Supervision of Banks with ECB Involvement*, 15 EUR. BUS. ORG. L. REV. 449, 454 (2014).

177 Council Regulation 1024/2013, 2012 O.J. (L 287) 64 (EU).

178 Michael Ioannidis et al., *The Mandate of the ECB: Legal Considerations in the ECB's Monetary Policy Strategy Review* 20 n.47 (Eur. Cent. Bank, Occasional Paper Series No. 276, 2021); Matthias Goldmann, *United in Diversity? The Relationship Between Monetary Policy and Prudential Supervision in the Banking Union*, 14 EUR. CONST. L. REV. 283, 290 (2018).

179 *See* Cassola et al., *supra* note 176, at 9-10.

180 *See* Goldmann, *supra* note 178, at 306. For the concern for expansive mandates, lack of accountability, and social license, see Paul Tucker, *How Can Central Banks Deliver Credible Commitment and Be "Emergency Institutions"?*, *in* CENTRAL BANK GOVERNANCE AND OVERSIGHT REFORM 55, 55 (John H. Cochrane & John B. Taylor eds., 2016); Charles I. Plosser et al., *Panel on Independence, Accountability, and Transparency in Central Bank Governance*, *in* CENTRAL BANK GOVERNANCE AND OVERSIGHT REFORM

with financial stability objectives, the SSM is a delegated framework coordinated with national bank supervisors who remain responsible for the bulk of the Euro-area banking sector.[181]

Pursuant to financial stability needs, the ECB robustly supervises Euro-area banks for adherence to new bank capital, liquidity, and leverage rules to avoid adverse market perceptions of banks' financial strength.[182] Simultaneously, maintaining a low interest rate helps banks in the lowest common denominator, i.e., those laden with non-performing debt[183] in the Euro-area, to survive.[184] Keeping the cost of credit low makes it less likely that challenged borrowers are pushed into default, allowing banks to "roll along' with such debt for as long as possible. In this manner, monetary policy objectives and financial stability objectives seem to cohere, as bank stability is preserved. However, dramatically low interest rates generally disincentivize banks from generating interest with relationship-based lending.[185] This development is exacerbated

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255 (John H. Cochrane & John B. Taylor eds., 2016); *see generally* FRANCESCO PAPADIA & TUOMAS VÄLIMÄKI, CENTRAL BANKING IN TURBULENT TIMES 1, 1-9 (2018).

181 Cassola et al., *supra* note 176, at 50-51.

182 Article 127(6) of the TFEU, *supra* note 176, empowers the SSM to undertake microprudential supervision. Microprudential supervision refers to the supervision of compliance with microprudential regulation, such as capital adequacy, liquidity and leverage rules introduced under the Capital Requirements Directive 2013 and Regulation 2013, respectively. *See generally* CHIU & WILSON, *supra* note 24, at chs. 8-9; *see also* Council Directive 2013/36, 2013 O.J. (L 176) (EU) (Capital Requirements Directive 2013); Council Regulation 575/2013, 2013 O.J. (L 176) (EU) (Capital Requirements Regulation 2013).

183 Usually defined as ninety days past due. *See* EUR. CENT. BANK, GUIDANCE TO BANKS ON NON-PERFORMING LOANS 49 (2017).

184 *See* KPMG, NON-PERFORMING LOANS IN EUROPE: WHAT ARE THE SOLUTIONS? 15 (2018).

185 *See generally* Goldmann, *supra* note 178; *see also* Joseph G. Haubrich & Tristan Young, *Trends in the Noninterest Income of Banks*, FED. RSRV. BANK OF CLEVELAND (Sept. 24, 2019), https://www.clevelandfed.org/en/newsroom-and-events/publications/economic-commentary/2019-economic-commentaries/ec-201914-trends-in-the-noninterest-income-of-banks.aspx [https://perma.cc/GNX5-75P7] (trend in the United States). This is in part mitigated slightly by the Eurosystem's cheap lending to banks, as discussed in Section I.A *supra*. S&P Global also observes that cheap lending by the Eurosystem to Euro-area banks can cause banks to decrease in their structured finance issuance, i.e., to transform debt-based assets into securities so that debt is ultimately channeled into capital markets. *See* GLOBAL STRUCTURED FINANCE 2021 OUTLOOK: MARKET RESILIANCE COULD BRING OVER $1 TRILLION IN NEW ISSUANCE, S&P GLOBAL RATINGS 37-48 (2021). However, even if some relationship-based lending is helped by cheap Eurosystem funding, the effects overall on bank business models may be uncertain.

by strong capital, leverage and resolution regulations[186] that further increase the costs of relationship-based lending.[187]

Whereas the Eurosystem has maintained its loose monetary policy operations including its vast asset purchase programs since the financial crisis of 2007-2009,[188] it has not led to cheap mass financial support for all parts of the economy, but skewed bank lending toward governments, public sector bodies and large and credit-rated corporations[189] as assets owed by these debtors are eligible for the Eurosystem's asset purchase programs. Hence, large parts of the real economy such as small and medium-sized businesses have not benefited much from the Eurosystem's expansive monetary loosening.[190] On the upside, we perceive that these suboptimal developments should incentivize banks in the Euro-area to look for new business models such as fee income-generation from financial intermediation in capital markets and embracing fintech innovations that generate transaction and service fee income,[191] a process that is strongly supported by the introduction of CBDE and the resulting flexibility in store of value intermediation.

The potential problems of the ECB's taking on the task of supervising important banks in the Euro-area and thereby an objective of financial stability different from, but alongside the Eurosystem's fundamental monetary objective of internal price stability, have long been subject to debate.[192] Although many argue

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See id.

186 *See* Chiu, *supra* note 39, at 696-98.

187 *See supra* Section I.A.

188 *See* JOSCHA BECKMANN ET AL., EUR. PARLIAMENT, THE ECB'S ASSET PURCHASE PROGRAMMES: EFFECTIVENESS, RISKS, ALTERNATIVES 7, 18 (2020) (discussing skeptically the long-term benefits of asset purchase programs in the Eurosystem's monetary policy implementation).

189 *See Asset Purchase Programmes*, EUR. CENT. BANK, https://www.ecb.europa.eu/mopo/implement/app/html/index.en.html [https://perma.cc/V3CW-RB6Z] (last visited Nov. 28, 2022).

190 *See* Paulet et al., *supra* note 54, at 37, 41.

191 Michael Brei et al., *Bank Intermediation Activity in a Low-interest Rate Environment* 10 (Bank for Int'l Settlements, Working Paper No. 807, 2020).

192 Donato Masciandaro, *Monetary Policy and Banking Supervision: Still at Arm's Length? A Comparative Analysis*, 9 EUR. J. COMPAR. ECON. 349, 355-58 (2012); *see generally* PAPADIA & VÄLIMÄKI, *supra* note 180, at 248-55; Juliet Johnson et al., *Adding Rooms onto a House We Love: Central Banking After the Global Financial Crisis*, 97 PUB. ADMIN. 546, 548-50 (2019).

that price and financial stability goals are interrelated and it is best that central banks have a thorough picture of financial sector risks,[193] sceptics warn that where there is a conflict of objectives, the price stability goal may affect financial institutions adversely,[194] or vice versa.[195] Indeed, financial stability concerns may have compelled the Eurosystem to keep interest rates low despite mounting inflation towards the end of 2021 and worse even in the first half of 2022,[196] as the prospect of weak banks turning insolvent due to a spike in legacy non-performing loans remains real.[197]

No textbook could have come up with a better example of a central bank dilemma than current realities faced by the Eurosystem. While inflation in the Euro-area stands above 7% in early 2022 and therefore at heights unknown since the early 1990s,[198] the ECB remains slow to act on inflation by tightening its monetary policies.[199] Neither the banking industry nor the Euro-area

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193 Goldmann, *supra* note 178, at 286 ("Today, hardly anyone doubts that monetary policy and the stability of financial institutions are highly interrelated."); *see also* THORSTEN BECK & DANIEL GROS, MONETARY POLICY AND BANKING SUPERVISION: COORDINATION INSTEAD OF SEPARATION 5-6 (2013); MAREK DĄBROWSKI, INTERACTION BETWEEN MONETARY POLICY AND BANK REGULATION: LESSONS FOR THE ECB 10-13 (2016); Joe Peek et al., *Is Bank Supervision Central to Central Banking?*, 144 Q. J. ECON. 629, 630-31 (1999).

194 *But see* Gerrit Tönningsen, *Trying to Square the Circle: The ECB's Janus-faced Character Post SSM and Its Implications for Effective Banking Supervision* (Eur. Banking Inst., Working Paper No. 27, 2018); Martin Hellwig, *Financial Stability, Monetary Policy, Banking Supervision, and Central Banking* (Max Planck Inst. for Rsch. on Collective Goods, Working Paper No. 2014/9, 2014) (showing how the central bank may be bound in a loop between the two objectives).

195 *Id.*; *see also* Carmine Di Noia & Giorgio di Giorgio, *Should Banking Supervision and Monetary Policy Tasks Be Given to Different Agencies?*, 21-23 (Universitat Pompeu Fabra, Economic Working Paper No. 411, 1999).

196 Johanna Treeck, *Despite Surging Inflation, ECB Sees No Rate Hikes in 2022*, POLITICO (Oct. 28, 2021), https://www.politico.eu/article/ecb-leaves-policy-on-hold-as-prices-surge/ [https://perma.cc/365K-XP3F].

197 Andrea Enria, *NPLs in the Euro Area: Progress So Far and COVID-19 Outlook*, EURO. CENT. BANK (May 19, 2021), https://www.bankingsupervision.europa.eu/press/speeches/date/2021/html/ssm.sp210519~84ac171a65.en.pdf [https://perma.cc/FH2X-P4Y9].

198 *Inflation in the Euro Area*, EUROSTAT (Aug. 31, 2022), https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Inflation_in_the_euro_area [https://perma.cc/7PV7-8WQ3].

199 Martin Arnold, *Christine Lagarde Rejects Calls for ECB to Act Faster on Inflation*, FIN. TIMES (Jan. 20, 2022), https://www.ft.com/content/8e2036b9-c02e-45e8-87d8-c9d3362415f1 [https://perma.cc/4LA9-9T5Z].

member states whose fiscal positions are weak, can (easily) shoulder the consequences of monetary tightening in the Euro-area.[200]

We perceive this dilemma as ultimately rooted in the fear that there would be economic and social disruption should there be a change of course from current loose monetary policy which is perceived as the "safest option" for weak Euro-area banks. However, the "safest option" for banks does not help banks become more innovative or competitive. We think that some extent of disruption cannot be avoided as the Eurosystem needs to unwind its levels of loose and unconventional monetary policies. But we argue the time has come to facilitate transformations of the bank business and that this transformation must be secured by a "safety net" for society. We suggest that if the banking sector becomes less "socially important" in relation to its store of value deposit services, the need to protect bank stability consequently wavers as the potential social fallout from episodes of bank instability can be contained when citizens have a default-proof CBDE public good to turn to. Further, relieving the banking sector of its social utility services can pave the way for banks' transformation of their business models.

This is not to say that banks' private deposit provision should be discouraged and actively disincentivized by the CBDE issuance model. Rather, we see an advantage of the public's unlimited access to CBDE as the safest and most favorable way to allow banks to freely choose their funding sources and preferred business models. Heightened flexibility for the banking sector results in a more manageable financial stability mandate for the ECB, a positive development that will be further supported by the regulatory reforms we propose in Part III. Finally, this recalibration of the ECB's role as the Eura-area's most important bank supervisor promises to allow the Eurosystem to pursue its monetary objectives more independently of financial stability concerns.

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200 On the sovereign debt crisis in more detail, see Christian Hofmann, *Greek Debt Relief*, 37 OXFORD J. LEGAL STUD. 1, 26-29 (2016). On the Eurosystem's reactions to the pandemic, see Hofmann, *supra* note 79, at 98.

2. Benefits of CBDE as a Means of Direct Monetary Policy

CBDE can potentially help the Eurosystem to implement its monetary policy objective more directly in the real economy.[201] Central banks may remunerate digital currency holdings in ways that directly translate monetary policy to the wider economy, therefore going beyond the traditional approach under which interest rate policy chiefly affects financial intermediation behavior. Interest rate policies set the price of money in an economy, and raising rates translate into potentially higher borrowing cost.[202] Rate hikes are the conventional response to inflationary developments in prices of real assets, especially those included in consumer price indices.[203] In the opposite manner, lowering interest rates make the price of money cheap so that financial intermediaries should feel incentivized to lend in order to generate returns from risk-taking.[204]

In conventional terms, central banks' monetary policy operations affect the real economy through the intermediation behavior of the financial sector.[205] However, issuing CBDC allows holders to have a direct claim upon the central bank,[206] whether the holdings are designed to be account-based or token-based.[207] For example, a negative remuneration rate on CBDC could directly affect real economy holders[208] as they are incentivized to use their holdings for consumption or investment to prevent "erosion" of

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201 *See* John Barrdear & Michael Kumhof, *The Macroeconomics of Central Bank Issued Digital Currencies* 10 (Bank of Eng., Staff Working Paper No. 605, 2016).

202 This is a common consequence of interest rate rises. *See* Tejvan Pettinger, *Effect of Raising Interest Rates*, ECONOMICSHELP (Aug. 4, 2021) https://www.economicshelp.org/macroeconomics/monetary-policy/effect-raising-interest-rates/ [https://perma.cc/X5SP-9RL6].

203 For example, the Bank of England has increased its base interest rate in response to double digit inflation in the UK. *See* Elliot Smith, *Bank of England Launches Biggest Interest Rate Hike in 27 Years, Predicts Lengthy Recession*, CNBC (Aug. 4, 2022) https://www.cnbc.com/2022/08/04/bank-of-england-launches-biggest-interest-rate-hike-in-27-years.html [https://perma.cc/4KQ6-YVHD].

204 For these general principles, see generally EUR. CENT. BANK, THE IMPLEMENTATION OF MONETARY POLICY IN THE EURO AREA—GENERAL DOCUMENTATION ON EUROSYSTEM MONETARY POLICY INSTRUMENTS AND PROCEDURES (2006).

205 *See* Bateman & Allen, *supra* note 144, at 425.

206 *See* EUR. CENT. BANK, *supra* note 2, at 38; *see also*, BANK OF ENG., *supra* note 3, at 35.

207 A distinction we return to in Part IV.

208 *See* BRUNNERMEIER & LANDAU, *supra* note 148, at 30-31.

value in their holdings. Such imposition of a negative interest rate can have a more marked effect on a wider range of economic behavior[209] beyond the contexts of borrowing or investing. On the other hand, a rise in interest rates may dampen consumption more directly and thereby combat inflation.

We argue that the opportunity to implement direct monetary policy via CBDE is not offensive to the Eurosystem's objectives and is part of the Eurosystem's useful toolkit. Commentators[210] uncomfortable with the use of CBDE and lower bound monetary policy argue that such a monetary policy tool is beyond the Eurosystem's mandate, as the legal framework for the Eurosystem's powers, such as in reserve creation, support the exercise of powers within a paradigm of transacting with financial institutions only, and not with a wider range of constituents in the public.[211] These commentators do not support the use of CBDE with direct monetary policy in mind.

If we follow the above argumentation, it seems that CBDE can only be justified in terms of a limited monetary policy basis,[212] i.e., to ensure that sufficient monetary objects exist in the economy in order for monetary policy to be effective. If cash declines in use,[213] and digital payments become the norm, then CBDE not only supports digital payments, but plays the crucial part in ensuring that there is sufficient digital "cash" in the sovereign's currency in the real economy, to continue incentivizing economic agents to denominate prices in the sovereign's currency, instead of moving, for example, to a system that accounts for prices in Dai.[214] This basis for the issuance of CBDE is supported by commentators as its role is in this respect no different from physical cash.[215]

However, we find the above argumentation excessively narrow.

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209 *See* Bindseil, *supra* note 128, at 23.

210 *See* Seraina N. Grünewald et al., *Digital Euro and ECB Powers*, 58 COMMON MKT. L. REV. 1029, 1029 (2021); *see also* Bateman & Allen, *supra* note 144, at 425.

211 This is arguably different in the UK. *See* Grünewald et al., *supra* note 210, at 1043.

212 *See id*.

213 *Id*.; *see also* Christian Pfister, *A Central Bank Digital Currency: Why? How? To What Effect?*, 39 BANKING & FIN. SERV. POL'Y REP. 9, 9 (2020).

214 MAKERDAO, https://makerdao.com/en/ [https://perma.cc/ZYY3-YFRD] (last visited Nov. 28, 2022).

215 *See* Zellweger-Gutknecht et al., *supra* note 145, at 304-07; Annelieke A.M. Mooij, *European Central Bank Digital Currency: The Digital Euro* 4 (BRIDGE Network, Working Paper No. 14, 2021).

If decline in cash use and the *need* for substitution of cash stock by CBDE is what underpins the issuance of CBDE, then an evidence basis is needed for this narrow justification of CBDE. Although this is observed in relation to the global rise in the use of digital payments,[216] there are vehement efforts made to protect the continued existence of cash.[217] This is because cash provides full anonymity and final settlement, and caters especially for the unbanked (or more broadly un-'accounted' digitally) in accessing goods and services commercially, therefore serving an important purpose in financial inclusion that has implications for the exercise of fundamental rights.[218] With policy makers mindful of both the potential financial inclusion effects of digital expansion,[219] it is uncertain that we may ever reach a critical point of "decline in cash" that provides an evidence basis for CBDE. In conclusion, we do not agree that the monetary policy mandate of the Eurosystem is limited to financial sector intermediation and therefore excludes transmission channels that are direct. In any case, the exclusive reliance on financial sector intermediation is not necessarily optimal as discussed above. The benefits from direct monetary policy should be usefully explored, even if this requires a new and explicit legal basis.

3. Options for Bank Business Transformation

The introduction of CBDE allows banks enhanced control over their funding sources and the ability to rid themselves of excess liquidity. Banks' increased freedom over what funding sources to pursue for the purpose of carrying out various business activities helps to promote bank business transformation in order to become more innovative and competitive. Banks can continue to pursue the funding sources of central bank liquidity and wholesale funding markets, as well as customer deposits, for the purpose of continuing

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216 *See* Barry Eichengreen, *From Commodity to Fiat and Now to Crypto: What Does History Tell Us?* 5 (Nat'l Bureau of Econ. Rsch., Working Paper No. 25426, 2019).

217 Such as by litigation in relation to the legal tender status of cash. *See* Press Release, Eur. Ct. of Just., A Euro Area Member State Can Oblige Its Administration to Accept Payments in Cash, but Can Also Limit That Payment Option on Public Interest Grounds (Jan. 26, 2021), https://curia.europa.eu/jcms/upload/docs/application/pdf/2021-01/cp210008en.pdf [https://perma.cc/Z8PK-5PN8].

218 Federico Lupo-Pasini, *Financial Inclusion and the War for Cash*, 84 L. & CONTEMP. PROBS. 17, 30 (2020).

219 *See* Wagner et al., *supra* note 147, at 178, 183.

with relationship-based lending. In this manner, banks keen on attracting customer deposits as a funding base may remunerate such deposits more competitively.

It is therefore far from evident that banks will become more reliant on central bank liquidity with the introduction of CBDE. However, even if they do, such reliance can be useful for influencing lending. Asset purchases by central banks or outright lending to banks could be applied in more selective ways, including for the purposes of steering towards the needs in productive[220] and sustainable finance[221] as supported by some commentators.[222] In this manner, relationship-based lending could be supported, but more robustly steered by public interest.[223]

An enhanced role of central banks as financial sector funders for relationship-based lending has been canvassed by a number of commentators who do not view this as a negative development.[224]

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220 "Productive finance" is defined in the UK, for example, with reference to long-term projects, including infrastructure. *See* PRODUCTIVE FIN. WORKING GRP., A ROADMAP FOR INCREASING PRODUCTIVE FINANCE INVESTMENT 15 (2021).

221 Sustainable finance is defined as investment seeking to achieve environmentally sustainable outcomes. *See* Council Regulation 2020/852, 2020 O.J. (L 198) (EU). Other outcomes consistent with the UN Sustainable Development Goals include the EU and UK's commitment to the UN Social Development Goals, one strategy of which is to mobilize private sector finance to achieve SDGs. *See Do You Know All 17 SDGs?*, UNITED NATIONS, https://sdgs.un.org/goals [https://perma.cc/A5M2-SUB6] (last visited Nov. 28, 2022) (outlining the UN's Sustainable Development Goals); *Sustainable Development: EU Sets Out Its Priorities*, EUR. COMM'N (Nov. 22, 2016), https://ec.europa.eu/commission/presscorner/detail/en/IP_16_3883 [https://perma.cc/LE5E-497Y] (expanding on the EU's commitment to UN Sustainable Development Goals); U.K. GOV'T, IMPLEMENTING THE SUSTAINABLE DEVELOPMENT GOALS (2021), https://www.gov.uk/government/publications/implementing-the-sustainable-development-goals/implementing-the-sustainable-development-goals--2 [https://perma.cc/H9UT-ZSQQ] (expanding on the UK's commitment to the UN's Sustainable Development Goals).

222 *See* Markus K. Brunnermeier & Dirk Niepelt, *On the Equivalence of Private and Public Money*, 106 J. MONETARY ECON. 27, 27-40 (2019); Alex Cukierman, *Welfare and Political Economy Aspects of a Central Bank Digital Currency* (Ctr. for Econ. Pol'y Rsch., Working Paper No. 13728, 2019); Young Sik Kim & Ohik Kwon, *Central Bank Digital Currency* (Bank of Kor., Working Paper No. 2019-6, 2019).

223 Steering financial sector allocation is mooted. TAMARA LOTHIAN, LAW AND THE WEALTH OF NATIONS ch. 2 (2017). We acknowledge the challenges in relation to politically steered lending. *See* Brendan Greely, *The Fed's Balance Sheet Is Normal and Political*, FIN. TIMES (April 30, 2022), https://www.ft.com/content/e4755fd5-81de-4aa6-8241-ca8973c37811 [https://perma.cc/W9D9-R4PE].

224 *See* Brunnermeier & Niepelt, *supra* note 222; Cukierman, *supra* note 222; Kim &

Indeed S&P Global observes that funding by central banks has a strong impact on banks' relationship-based lending and structured finance by which banks channel assetized debt products into capital markets.[225] Central banks in their role as financial sector funders can fruitfully stimulate optimal forms of relationship-based lending[226] that should be performed by lenders who are information and diligence experts adept at underwriting risk.

Alternatively, banks may decide to see the introduction of CBDE as an opportunity for less reliance on debt financing. They may choose to reduce the size of their balance sheets and find new and innovative ways of financial intermediation that meet credit needs, while transforming risks with less direct prudential burdens. It is not inconceivable for banks to lose customers as depositors, but to engage them instead in partial intermediation models for credit, such as how Zopa[227] is transforming lending in the UK via its peer-to-peer lending business model. Zopa takes in retail funds and spreads them across multiple borrowers on its peer-to-peer lending platform in order to diversify investors' risks. Investors, however, fully bear the default risk of their borrowers, subject to Zopa's enforcement policies if default takes place. Although this business model is framed in terms of "investment," Zopa also has a full banking license in the UK and it has been critically commented[228] that the boundaries are blurring between "banks" and "non-bank" entities essentially taking on similar functions and intermediating the same types of risks even if the ultimate addressee of risk allocation may be changed. It is conceivable that a form of partial intermediation where potential loss to investors' capital may be backstopped by a cap while investors trade off some investment returns for such a cap may attract slightly more risk-averse customers. Such business transformations and diversifications provide customers with more choices in relation to their risk for return decisions.

Kwon, *supra* note 222.

225 S&P Glob., *supra* note 185, at 37-48.

226 Robert Hockett, *Open the Marriage to Save It: A Peer-to-Peer Savings and Payments Platform and Complementary Digital Euro Plan* 3-4 (Cornell L. Sch. Rsch. Paper No. 19-40, 2019), https://ssrn.com/abstract=3470934 [https://perma.cc/3WC3-CH5N].

227 ZOPA, https://www.zopa.com/ [https://perma.cc/M8P3-ERRW] (last visited Nov. 28, 2022).

228 Bavoso, *supra* note 72, at 48-75.

Further, non-bank entities have been stepping into credit gaps since the market entrance of motor finance specialists, mortgage specialists and hire purchase financiers. "Buy now, pay later" companies intermediate credit risks in new ways,[229] while the rejuvenation of securitization markets for different types of loans, from student loans to small business loans, is also important in meeting credit needs.[230] In this manner, "bank" and "non-bank" business transformations and competition are important to bring about a richer, more diverse market that offers choice for customers as well as possibly greater resilience[231] for the financial system overall in a diverse landscape. Regulatory rethinking is indispensable[232] and will be beneficially kickstarted by allowing such market developments. The regulatory coherence between bank and non-bank financial intermediation is a rich issue that is beyond the exploration of this article, but we posit that this beneficial development can be kickstarted and, in tandem with our proposals in Part III, reshape bank and financial regulation for more innovative and competitive financial services to customers.

We turn now to Part III which discusses how potential transformations in the banking sector can be supported by revisiting the "iron law of financial regulation" discussed in Part I. There are

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229 Nikita Divissenko, *Buy Now, Pay Later: The Role of EU Regulation in Shaping the "New Normal,"* EUIDEAS (Dec. 17, 2020), https://euideas.eui.eu/2020/12/17/buy-now-pay-later-the-role-of-eu-regulation-in-shaping-the-new-normal/ [https://perma.cc/9H6H-AD97]; *see* FIN. CONDUCT AUTH., *supra* note 73 (demonstrating the relatively piecemeal approach to regulation in the UK); *FCA Secures Contract Changes*, *supra* note 73 (demonstrating how the FCA secures contract changes while avoiding the full conduct of business regulation applicable to credit entities).

230 Tatiana Darie, *Sales in European Collateralized Loan Obligations Hit Post Financial-crisis Record*, BLOOMBERG (Oct. 26, 2021), https://www.bloomberg.com/news/articles/2021-10-26/sales-in-european-clos-hit-record-thanks-to-buyout-debt-surge [https://perma.cc/T5R9-QKUP].

231 LUIGI ZINGALES, CAPITALISM FOR THE PEOPLE: RECAPTURING THE LOST GENIUS OF AMERICAN CAPITALISM 29 (2012).

232 The changing nature and structures of financial intermediation and markets activity have prompted financial regulatory rethinking across the decades. *See* Richard Dale & Simon Wolfe, *The Structure of Financial Regulation*, 6 J. FIN. REGUL. & COMPLIANCE 326, 326-42 (1988); Saule Omarova & Adam Feibelman, *Risks, Rules, and Institutions: A Process for Reforming Financial Regulation*, 39 U. MEM. L. REV. 881, 881-930 (2009); Saule Omarova, *Technology v. Technocracy: Fintech as a Regulatory Challenge*, 6 J. FIN. REGUL. 75, 75-124 (2020) (discussing changes recently brought about by financial technology); Saule Omarova, *New Tech v. New Deal: Fintech as a Systemic Phenomenon*, 36 YALE J. REGUL. 735, 735-93 (2019).

deregulatory implications as certain regulatory burdens may be less necessary with banks' business transformations, and such an agenda further assists the ECB in trimming down its financial stability mandate, to be one that is more manageable and responsive to changes in the industry.

III. An Agenda for Meaningful Deregulation of the European Banking Sector?

We have earlier discussed in Section I.A the key burdens imposed under the "iron law of financial regulation" after the global financial crisis. Although the full intermediation model of credit risk by banks requires a robust regime of prudential regulation and crisis intervention mechanisms, regulatory imposition also makes the banking business expensive and hampers its efficiency.

At the core of bank regulation lie two regulatory objectives: retail customer protection and financial stability. If banks can experience difficulties and default on their obligations in the normal vicissitudes of business, without jeopardizing financial stability and leaving retail depositors unprotected, liquidity, credit and maturity transformation can become possible without massive interference from regulatory regimes.

We suggest here that the introduction of unlimited CBDE offers a unique chance to roll back regulation that has now resulted in unintended business consequences. Even Member States subject to European bank regulation which have not adopted the euro can consider adopting an unlimited digital currency based on the same arguments and benefits we suggest in this article. Whereas deposit funding from the public would become more expensive for commercial banks with the introduction of CBDC,[233] these increased expenses could be more than mitigated by the reduced cost from an appropriate deregulatory agenda.

In particular, we discuss the deregulatory agenda in the following respects:

(a) less stringent prudential regulatory frameworks which can reduce the cost of compliance, particularly for banks that are not systemically important (Section III.A *infra*);

(b) less stringent resolution and recovery regulations which may

233 Assuming that banks remain interested in deposit funding, discussed in Section II.B *supra*.

reduce the cost of funding for debt and equity instruments issued by banks (Section III.B *infra*);

(c) the abolition of deposit insurance schemes (DIS) (Section III.C *infra*);

(d) the abolition of resolution funding mechanisms (Section III.D *infra*);

(e) lower cost for banks from reduced contributions to authorities because the tasks of supervisory and resolution authorities could be shrunk and their workload and expenses thereby lowered (Section III.D *infra*).

All of these developments would reduce banks' compliance costs and thereby help them regain higher profitability margins and soften (or even entirely absorb) the impact of higher funding costs stemming from the introduction of unlimited CBDE. The regulatory changes we propose below also reinforce business model transformations discussed in Part II.

A. Simplification of Going Concern Prudential Requirements

Prudential requirements for banks on a going concern basis, originally in the form of capital adequacy requirements, are inseparable from the state's provision of authorization for banks to engage in their risky business activities.[234] Commercial banks become the legal owners of all monies transferred into deposit accounts and are authorized to make unrestricted use of these borrowed means for the purposes of their businesses.[235] The resulting risks are tolerated because of the roles that commercial banks serve as the most essential financial intermediaries whose task it is to allocate liquidity effectively.[236] Capital adequacy requirements compel banks to measure and price their risks robustly

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234 *See* JOHN ARMOUR ET AL., PRINCIPLES OF FINANCIAL REGULATION 290-93 (2016) (illustrating the typical risks of the banking business and the process of risk transformation); José Gabilondo, *Central Banks, Systemic Lending, and Collateral Markets*, *in* RESEARCH HANDBOOK ON CRISIS MANAGEMENT IN THE BANKING SECTOR 24, 24-26 (Matthias Haentjens & Bob Wessels eds., 2015); Paul Davies, *Liquidity Safety Nets for Banks*, 13 J. CORP. L. STUD. 287, 289-92 (2013); Rosa Lastra, *Central Bank Independence and Financial Stability*, 18 REV. ESTABILIDAD FINANCIERA 49, 63 (2010).

235 This transformation model that sees customers' monies become the property of commercial banks forms the very business model of banks. *See* Gabilondo, *supra* note 234, at 24-26; ARMOUR ET AL., *supra* note 234, at 290-93.

236 For more on this fundamental point about the purpose of banking, see Gabilondo, *supra* note 234, at 24-26; ARMOUR ET AL., *supra* note 234, at 290-93.

and represent the price commercial banks must pay for the wide freedom they enjoy.[237]

Capital serves as a safety cushion when risks inherent in the banking business materialize and assets experience write-downs and write-offs. Regulatory capital requirements limit banks' leveraging powers because they force banks to hold the amounts of capital considered adequate in relation to the risk of loss inherent in their assets.[238] Ultimately, all their risk exposures must be co-financed by a predetermined amount of capital.[239] This amount is calculated as a fraction of banks' assets and certain off–balance sheet items which convert into assets when events occur over which the banks have no ultimate control.[240]

The need to maintain capital adequacy, as a matter of principle, should remain intact after the introduction of an unlimited CBDE model, and in spite of any deflations of banks' balance sheets. This is because we see that the raison d'être for capital adequacy, i.e., that banks should be accountable and steered prudently in their risk-taking activities, remains. However, it is arguable that the current extensive prescriptions for regulatory capital for going concern purposes can be revisited especially in light of the disincentives that have been caused for relationship-based lending (as discussed in Parts I and II).

First, we propose revisiting standard risk weightings prescribed in prudential capital regulation. Standard risk weightings are assigned to types of assets in order to provide certainty in regulators' risk treatment of banks' lending[241] and to prevent banks from having discretion to self-assess risk which may tend towards being too low. In the wake of the global financial crisis, regulators have now prescribed standard risk weightings more extensively and conservatively[242] so banks do not have much room to avoid the

237 Chiu, *supra* note 39, at 639-85.

238 *Id*.

239 For the minimum capital ratios, see *Risk-based Capital Requirements*, BANK FOR INT'L SETTLEMENTS (DEC. 15, 2019), https://www.bis.org/basel_framework/standard/RBC.htm [https://perma.cc/ZD9W-DKV4].

240 For generally applicable principle, see MONETARY AUTH. OF SING., NOTICE 637: NOTICE ON RISK-BASED CAPITAL ADEQUACY REQUIREMENTS FOR BANKS INCORPORATED IN SINGAPORE, ¶¶ 4.1.1-4.1.3. (rev. 2021).

241 *See* Council Regulation 575/2013, 2013 O.J. (L 176) 30-48 (EU).

242 *Id*.

costly capital allocations associated with each loan. This results in some areas in demand for credit that is underserved. We consider that reforms to standard risk weightings should discourage excessive lending that fuels asset price bubbles and to encourage more lending to finance innovative, productive or sustainable businesses. The standard risk weighting of 35% for residential mortgages could be revisited, for example, to build more nuance for buy-to-let mortgages, and certain high loan-to-value ratio mortgages while not excessively discouraging first-time homebuyers. This relatively favorable standard risk weight still skews banks towards funding housing market price bubbles. Further, in the same direction, standard risk weightings for certain types of sovereign debt have been very low and remain so after the global financial crisis, incentivizing banks to lend excessively to these sectors and fueling excessive demand for "safe assets."[243] Reforms to standard risk weightings can be considered to influence lending decisions in order to promote certain economic goals, such as sustainability transition for the corporate sector.

It has been suggested that higher risk weightings can apply[244] where lending to companies that maintain "brown assets" is concerned. This may be in spite of certain companies with brown assets enjoying a generally high credit rating, hence qualifying as "safe assets." Such reform can disincentivize banks from agnosticism in relation to funding sustainable and long-term changes to the economy. In the opposite manner, capital "discounts" can be offered where business lending furthers innovation, green, developmental, and sustainable or productive purposes which can be tied to green and social taxonomies[245] for investments that relate to the realization of outcomes that are financially as well as non-

243 Usually government debt. *See* Gary Gorton & Guillermo Ordoñez, *The Supply and Demand for Safe Assets*, 125 J. MONETARY ECON. 132, 132 (2020). For discussion on adverse economic effects from excessive creation of such safe assets, see Sushant Acharya & Keshav Dogra, *The Side Effects of Safe Asset Creation*, 20 J. EUR. ECON. ASS'N 581, 592-93 (2021).

244 Jay Cullen, *After "HLEG": EU Banks, Climate Change Abatement and the Precautionary Principle*, 20 CAMBRIDGE Y.B. EUR. LEGAL STUD. 61, 84 (2018).

245 *See, e.g.*, Council Regulation 2020/852, 2020 O.J. (L 198) 13, 16 (EU); *see also Platform on Sustainable Finance*, EUR. COMM'N, EU TAXONOMY & PLATFORM 22-23 (2021), https://finance.ec.europa.eu/sustainable-finance/overview-sustainable-finance/platform-sustainable-finance_en [https://perma.cc/67ZB-AJYG] (explaining that a social taxonomy is proposed for finance that purports to achieve various social outcomes as well).

financially material.

Next, we propose that capital buffer rules in prudential regulation can be revisited. Capital buffers are additional capital requirements that add on to capital adequacy ratios and are also measured based on risk-weighted assets, as the latter is often seen as not being sufficiently conservative.[246] After the global financial crisis, the application of capital buffers almost doubled the amount of capital banks have to hold against their lending.[247]C The use of capital buffers can impose cost on banks where there may be excessive lending, concentrations of risk and asset price bubbles, so as to steer financial allocation activities. The use of the EU's systemic risk buffer, for example, imposes additional cost on banks over-exposed to real estate financing.[248] During the Covid-19 pandemic, however, financial regulators suspended some capital buffers in order to free up the cost of lending for banks to keep access to finance undisrupted during the difficult economic lockdown periods.[249]

Depending on how banks transform or shrink their activities, capital buffers directed at them, especially buffers dependent on levels of systemic importance, can be considered for adjustment if an unlimited CBDE model is implemented. An evidence basis regarding the credit intermediation activities of banks and non-banks would be needed, so that capital buffers directed at potential systemic risks can be recalibrated and more widely dispersed. Capital buffers resulting from macro-economic considerations such as the capital conservation and counter-cyclical buffers should remain tools at the disposal of regulators in response to broad economic conditions, but the need for triggering may decrease if

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246 *See* Council Directive 2013/36, 2013 O.J. (L 176) 338, 404-05, 407, 411 (EU) (examples of Capital Requirements Directives (CRD)); *see also* BANK FOR INT'L SETTLEMENTS, *supra* note 51, at 54-60 (buffers for systematically important banks); FIN. STABILITY BD., PRINCIPLES ON LOSS-ABSORBING AND RECAPITALISATION CAPACITY OF G-SIBS IN RESOLUTION (2015) (application of higher loss absorbency requirements for G-SIBs).

247 Council Directive 2013/36, 2013 O.J. (L 176) 338, 404-05, 407, 411 (EU); BANK FOR INT'L SETTLEMENTS, *supra* note 51, at 54-60; FIN. STABILITY BD., *supra* note 246.

248 This was amended in 2019. *See* Council Directive 2019/878, 2019 O.J. (L 150) 253, 286-89 (EU).

249 Iris H-Y Chiu et al., *Relief and Rescue: Suspensions and Elasticity in Financial Regulation, and Lessons from the UK's Management of the Covid-19 Pandemic Crisis*, 64 WASH. UNIV. J. L. & POL. 63, 75 (2021).

financial allocation becomes more efficient, diversified and productive because of a wider and more competitive lending landscape that results from bank business transformation. The deregulatory agenda for banks frees regulators from over-concentration of their regulatory resources on banks and allows regulators to develop greater joined-up conversations and oversight of shadow banking and alternative financing industries, which will become a pressing need with the progress of bank business transformations and entanglement with non-bank entities (as discussed *supra* Section II.B.3 and *infra* Part IV).[250]

Finally, we also argue that liquidity regulations imposed on banks can be adjusted in this deregulatory agenda. In reaction to commercial banks' exposure to liquidity shortages during the global financial crisis, Basel III introduced two new mechanisms that prepare banks better for sudden withdrawals of lending commitments from banks' most important creditors, especially retail depositors and other financial institutions. On the one hand, the liquidity coverage ratio (LCR) rule requires banks to hold sufficient amounts of liquid assets to survive a thirty-day period of extreme stress that sees its liquidity dry up and assets priced down.[251] On the other hand, funding periods on the liabilities side must match commitment periods on the assets side to ensure that commercial banks do not encounter liquidity issues for a time window of one year under normal circumstances under the net stable funding ratio (NSFR) rule.[252]

The continued need for these requirements is likely to be less pressing. Liquidity regulations are crucially concerned with sustaining banks through the stresses of deposit runs, and the introduction of an unlimited CBDE changes the deposit relationship

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250 Laura Kodres, *Shadow Banking: Out of the Eyes of Regulators*, FIN. & DEV. 52, 53, https://www.imf.org/external/pubs/ft/fandd/basics/pdf/kodres-shadow-banking.pdf [https://perma.cc/3ZVE-LVRX] (last visited Nov. 28, 2022); *see* Darie, *supra* note 230 (showing that, for example, a lot of business lending is now channeled to capital markets via collateralized loan obligations which are securitized products, as bank lending shrinks).

251 *See* Council Regulation 575/2013, 2013 O.J. (L 176) 240, 242-44 (EU) (capital requirements regulation); *see generally* BANK FOR INT'L SETTLEMENTS, BASEL III: THE LIQUIDITY COVERAGE RATIO AND LIQUIDITY RISK MONITORING TOOLS 14-17 (2013) (detailing the liquidity coverage ratio).

252 *See generally* BANK FOR INT'L SETTLEMENTS, BASEL III: THE NET STABLE FUNDING RATIO (2014) (details on the net stable funding ratio); Council Regulation 2019/876, 2019 O.J. (L 150) 149-50 (EU) (amendments to capital requirements regulation).

between customers and private sector deposit-taking entities. Current liquidity requirements also tend to disincentivize banks from holding illiquid assets and this may dampen meaningful relationship-based lending such as SME finance.[253] Hence, these liquidity requirements and their unintended consequences appear ripe for revisiting. The stable funding requirements can also be applied more flexibly, in order to take the emergence of alternative lending industries into account, similar to split regimes for banks above and below levels of systemic importance already in place in some jurisdictions.[254]

B. Simplification of Recovery and Resolution Regimes

Recovery and resolution regimes are regulators' response to the sobering events during the global financial crisis of 2007-2009 when commercial banks and other financial institutions proved too complex to be dealt with under ordinary principles of insolvency law and were bailed out by governments.[255] These regimes require systemically important financial institutions to prepare for crisis scenarios where they suffer significant losses which weaken their capital positions as loss absorption takes place. At the recovery stage, recovery and resolution regimes rely on conversions of convertible debt instruments into Common Equity Tier 1 instruments and potential dispositions of assets, as well as change in management, in order to return troubled banks to resilience.[256] Since investors in convertible instruments demand adequate risk premia, commercial banks must pay a price for their preparedness for worst case scenarios.[257]

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253 Anagnostopoulos & Kabeega, *supra* note 54, at 142; *see* Paulet et al., *supra* note 54, at 38.

254 For Singapore's approach that subjects systematically important banks (DSIBs) to strict liquidity and stable funding rules, while less burdensome rules called the minimum liquid assets requirements apply to non-DSIBs, see MONETARY AUTH. OF SING., NOTICE 652: NET STABLE FUNDING RATIO ¶¶ 2(b)-2(c) (rev. 2022); MONETARY AUTH. OF SING., NOTICE 649: MINIMUM LIQUID ASSETS AND LIQUIDITY COVERAGE RATIO ¶¶ 2-4, (A)-(B), 35-109 (rev. 2022).

255 Rosa Lastra, *Northern Rock and Banking Law Reform in the UK*, *in* THE FAILURE OF NORTHERN ROCK: A MULTI-DIMENSIONAL CASE STUDY 131, 136 (Franco Bruni & David T. Llewellyn eds., 2009).

256 BRRD, *supra* note 8, arts. 35, 43-44.

257 For details about the recovery planning phase, see Emilios Avgouleas et al., *Bank Resolution Plans as a Catalyst for Global Financial Reform*, 9 J. FIN. STABILITY 210, 211-212 (2013); Kern Alexander, *Enhancing European Bank Resolution and Recovery*, 19

Recovery plans can only prepare commercial banks for foreseeable difficulties. Unexpected developments are more dangerous and require intervention mechanisms applied on an ad-hoc basis by expert authorities in order to achieve key protections for certain stakeholders[258] and the orderly apportionment of losses to creditors. Consequently, lawmakers have developed complex resolution regimes and highly specialized resolution authorities have been established.[259] The Euro-area has invested massively in crisis management and relies on its SRB with resolution powers over the entire Euro-area.[260] Resolution authorities' most important role is to stand ready at any time to apply a set of sophisticated resolution mechanisms to save failing banks' critical financial functions (CFFs).[261] The most important of these CFFs are (once again) retail deposits and retail payment systems. The introduction of CBDE can lead to much relaxation of these rules.

Under current rules, resolution authorities and DIS must jointly organize the absorption of a failing bank's deposit liabilities by one of its healthy competitors so that retail depositors lose neither their claims nor their instant access to cash withdrawal and fund transfer services. Such transfers of deposits from one bank to another require that the healthy bank absorbs the deposit liabilities of the failing bank.[262] No absorbing bank can agree to such a deal unless it receives full compensation, but since the failing bank has no more (adequate) assets to transfer, this compensatory funding can only come from external sources such as resolution financing mechanisms (also called resolution funds), state aid or bailed-in

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MAASTRICHT J. EUR. COMP. L. 459, 462 (2012).

258 *See* BRRD, *supra* note 8, arts. 37-44 (referring to resolution being triggered).

259 See FIN. STABILITY BD., KEY ATTRIBUTES OF EFFECTIVE RESOLUTION REGIMES FOR FINANCIAL INSTITUTIONS 5-6 (2014), for the leadership of the Financial Stability Board in this area for global adoption.

260 Council Regulation 806/2014, 2014 O.J. (L 225) (EU) (SRM regulation).

261 *See* IRIS H-Y CHIU & JOANNA WILSON, BANKING LAW AND REGULATION 641, 649, 652 (1st ed. 2013); JIANPING ZHOU ET AL., FROM BAIL-OUT TO BAIL-IN: MANDATORY DEBT RESTRUCTURING OF SYSTEMIC FINANCIAL INSTITUTIONS 8-9 (2012); MICHAEL SCHILLING, BANK RESOLUTION REGIMES IN EUROPE II—RESOLUTION TOOLS AND POWERS 3-5 (2012).

262 For example, the resolution of Dunfermline Building Society in the UK involved the transfer of all assets and liabilities including deposit liabilities to the acquiring bank, which was Nationwide. *See* Press Release, Bank of Eng., Dunfermline Building Society (Mar. 30, 2009), https://www.bankofengland.co.uk/-/media/boe/files/news/2009/march/dunfermline-building-society.pdf [https://perma.cc/GZ2T-SQ4H].

creditors.[263] But whichever option the resolution authorities choose, it will be expensive: for the banking industry (as *ex ante* cost) because banks must pre-finance readily available resolution funding mechanisms;[264] for taxpayers because the fallback solution will always be state aid; and for commercial banks because they must provide investment incentives to their creditors in light of risks that claims might be bailed in when resolution authorities take over the orchestration of the resolution process.[265]

An unlimited CBDE model can avoid these costs. If a failing bank provides CBDE account services, it does so as a custodian, as described in Part IV. This is different from deposits which are owned by banks and used for banks' financial intermediation (mostly for lending). This also means that the amounts held in CBDE accounts are irrelevant for the determination of a bank's financial health. All amounts in deposit accounts are the bank's liability and can lead to its balance sheet insolvency when its assets are written off or written down, but customers' holdings in CBDE accounts are liabilities which reflect in central banks' balance sheet.[266] They are not those of banks which instead only provide a custodial service. In resolution scenarios, CBDE accounts are in our view easy to shift to another custodial provider. An absorbing custodial provider does not accept a new liability as it does when it absorbs a failing bank's deposits, but merely an access and transfer service for a central bank's liability. Consequently, such transfers

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263 *See* FIN. STABILITY BD., KEY ATTRIBUTES OF EFFECTIVE RESOLUTION REGIMES FOR FINANCIAL INSTITUTIONS 12 (2014).

264 *Id*. at 8, 12.

265 Bail-ins of creditors reduce the bank's debt and thereby strive to re-establish its compliance with capital requirements. Bail-ins of shareholders increase the amounts of equity that ranks lowest in the creditor hierarchy and reduce the number of equity holders, thereby providing the grounds for debt-to-equity swaps and increasing the bank's attractiveness for new investors. *See* Emilios Avgoulas & Charles Goodhart, *Critical Reflections on Bank Bail-ins*, 1 J. FIN. REGUL. 1, 3-4, 19 (2015); Magdalena Ignatowski & Josef Korte, *Wishful Thinking or Effective Threat? Tightening Bank Resolution Regimes and Bank Risk-taking*, 15 J. ON FIN. STABILITY 264, 265-66 (2014); Abigail Boyd, *Bail-ins—Just Another Self-Fulfilling Prophecy?*, 27 BANKING & FIN. L. REV. 599, 600 (2012); Lucy Chennels & Venetia Wingfield, *Bank Failure and Bail-in: An Introduction*, 2015 Q3 BANK ENG. Q. BULL. 228, 230 (2015).

266 BANK OF ENG., *supra* note 3, at 31; EUR. CENT. BANK, DIGITAL EURO EXPERIMENTATION SCOPE AND KEY LEARNINGS 8 (2021); Wouter Bossu et al., *Legal Aspects of Central Bank Digital Currency: Central Bank and Monetary Law Considerations* 10 (Int'l Monetary Fund, Working Paper No. WP/20/254, 2020).

do not need to be counter-financed as deposit transfers. Customers can enjoy continuity of services related to their CBDE accounts because transfer and payment services are immediately facilitated by the absorbing entity instead of the failing bank.

In contrast, bank deposit accounts can be treated like any other unsecured liabilities and therefore lose the privileged status they are enjoying presently (Section III.C *infra*). The reason for this paradigm shift lies in the unique opportunities that CBDE offer to retail customers. They can individually decide how much of their savings to keep in risk-free CBDE, which offer them store of value and electronic payment opportunities, and how much to expose to risk for higher returns, including commercial bank money in deposit accounts which will in our model no longer profit from deposit insurance (Section III.C *infra*), and therefore be treated like any other form of investment.

As a result of all of the above, resolution processes can be simplified as the largest liabilities of failing banks, i.e., deposits, are taken care of, and assets of failing banks such as loans are attractive for other lenders to take on. Loans remain attractive to absorbing lenders because there is no need for early termination of loan agreements between the failing bank and its customers, since borrowers can continue to pay their installments to a lender that absorbs the lending business of the failing bank. In this manner, we also think that market processes such as private sector acquisition[267] would work well in resolutions where there are sufficient numbers of competitive and healthy lenders offering to buy the assets of distressed banks. Resolution processes can become part and parcel of the natural outworking of competitive capitalism in the lending sector. We also expect new providers of lending services to enter the market and stimulate competition between commercial banks and other financial intermediaries and lead to more choices for borrowers (as discussed in Part II). Lending business will continue to be attractive as demand remains indefatigable,[268] a fact that is not expected to change with the introduction of CBDE.

Overall, recovery and resolution planning can become much

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267 One of the key means for bank resolution. *See* BRRD, *supra* note 8, art. 38.

268 *See e.g.*, Press Release, Eur. Cent. Bank, October 2021 Euro Area Bank Lending Survey (Oct. 26, 2021), https://www.ecb.europa.eu/press/pr/date/2021/html/ecb.pr211026~fce9ee40ee.en.html [https://perma.cc/AZ4U-LHH8].

simpler. Bank supervisors still need to prepare for failure scenarios, but only insofar as they need to ensure that transfers of CBDE account services to sound providers can be easily carried out. With this simple step, the resolution authorities can respond to the principle that bank failures must not jeopardize the basic financial needs of retail customers.

Depositor protection is not the only cause for recovery and resolution regimes. Financial stability concerns are at least equally important drivers in the sense that resolution processes are intended to provide orderly actions that minimize disruptive and contagious effects on other parts of the financial sector when a bank fails. However, financial stability concerns will likely be much less common in bank failure scenarios if the introduction of an unlimited CBDE model leads to new levels of innovation and bank business transformation, therefore paving the way for a more diversified and competitive financial landscape. In a diversified financial landscape, commercial banks may less likely sustain the profile of being systemically important in Euro-area economies and can therefore be allowed to fail in an orderly fashion and be liquidated in insolvency proceedings.

The need for taxpayer-funded bailouts will likely disappear, thereby relieving strains on sovereign budgets, and bail-ins of private sector creditors can become simpler and more akin to loss absorption like in any corporate insolvency, instead of the current complex regime involving bail-in. Bail-ins were introduced as a mechanism that ensures that creditors participate in the losses of a failing bank, principally with a view to rescuing and recovering it. Hence, bail-in is first supported by a set of complex bank funding rules in relation to the minimum requirements of eligible liabilities (MREL) discussed shortly below. These MREL rules are also intended to facilitate creditors' "monitoring" of risk-taking by banks because the riskiness of the bank's business steers the prices of MREL instruments.[269]

EU legislation requires substantial bail-ins before state aid can be provided to ease the burden on public finances.[270] However, this requirement is hampered by the same legislation because it also discriminates against normal creditors by exempting groups of other

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269 *But see* Edoardo Martino, *The Bail-in Beyond Unpredictability: Creditors' Incentives and Market Discipline*, 21 EUR. BUS. ORG. L. REV. 789, 799 (2020).

270 BRRD, *supra* note 267, art. 37(10)(a).

creditors[271] and thereby deviates from normal insolvency principles. The administration of bail-in has resulted in complexity and lawsuits in the Euro-area, such as the Banco Popular bondholders' suit against the SRB.[272]

Currently, a complex set of principles protects a range of claims from bail-ins for mostly three reasons. Retail deposits are exempted to avoid losses for this vulnerable group of creditors; claims of financial institutions, including commercial banks, are exempted for fear of jeopardizing financial stability; and claims of everyone whose services enable the bank to continue operating or are essential for the functioning of financial markets are spared.[273]

We predict the obsolescence of bailouts in a landscape where bank business transforms with the advent of CBDE, as discussed above. Hence, bail-ins can also become either simpler or optional. The need for prevention of bank failure and ultimate recovery, which is the rationale of bail-ins, is significantly weakened as ailing banks can be eliminated by the processes of competitive capitalism and be allowed to fail without crucial disruptions. The most important reason for these changed realities is once again the positive effect that CBDE would provide the public good of store of value for the non-risk-taking public. The abolition of bail-ins could be justified by their inefficiency: they lead to high costs of funding for banks while not achieving optimal results in terms of creditor monitoring of bank risk and prevention of bank failures;[274] they also lead to constant cost for resolution authorities such as the SRB, especially when their judgments are questioned in protracted proceedings.

An important and key regulatory burden for banks that can be lifted in the deregulatory agenda for recovery and resolution is loss-

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271 *Id*. art. 44(2).

272 Jennifer Laidlaw, *Banco Popular Bondholders File New Suit Against EU Body in European Court*, S&P GLOB. (Jan. 8, 2019), https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/banco-popular-bondholders-file-new-suit-against-eu-body-in-european-court-49241435 [https://perma.cc/NA8Q-G78R]. This was dismissed by the European Court of Justice in 2022. *See* Emilio Demetriou-Jones, *EU's Top Court Throws Out Banco Popular Bondholders' Appeal*, GLOB. RESTRUCTURING REV. (Jan. 28, 2022), https://globalrestructuringreview.com/article/eus-top-court-throws-out-banco-popular-bondholders-appeal [https://perma.cc/5P4A-BSA4].

273 BRRD, *supra* note 8, art. 44(2).

274 Martino, *supra* note 269, at 813-15.

absorbing capital. The EU has implemented MREL,[275] a regime that prescribes for banks the need to hold an amount of loss absorbing capital in addition to prudential capital requirements for going concern purposes (discussed *supra* Section III.A). The MREL in theory applies to all banks, but in practice the EU has extended this only to global and domestic systemically important banks (SIBs).[276] These SIBs are required to hold MREL to absorb losses that threaten to wipe out banks' capital positions as well as to allow banks to recapitalize to minimum capital adequacy levels so as to recover and continue their operations.[277] In this manner, MREL is set at about twice the amount of regulatory capital in order to perform its expected functions.[278] Although MREL can be funded by a less restrictive range of financial instruments than prudential capital, holding MREL in addition to prudential capital means that banks are imposed with going and gone concern capital requirements that are about three times the amounts needed prior to the global financial crisis. It is evident that banks incur significant cost in issuing debt and equity instruments to obtain this combined funding.[279] With no or at least reduced need for bail-ins, we consider that regulators can take the opportunity to reduce or abolish MREL.

C. Redundancy of Deposit Insurance

The most obvious regulatory mechanism that would be positively affected by the introduction of CBDE is deposit insurance. DIS indemnify retail depositors up to pre-determined maximum amounts when commercial banks default on their payment obligations.[280] These objectives underly the concept of

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275 BRRD, *supra* note 8, art. 45; SINGLE RESOL. BD., MINIMUM REQUIREMENT FOR OWN FUNDS AND ELIGIBLE LIABILITIES (MREL): SRB POLICY FOR 2017 AND NEXT STEPS 5 (2017).

276 SCHILLING, *supra* note 261, ¶¶ 11.18-11.23; *see also* Matthias Lehmann, *Bail-in and Private International Law How to Make Bank Resolution Measures Effective Across Borders*, 66 INT'L & COMP. L. Q. 107, 109-10 (2017).

277 The purpose of MREL is set out, for example, by the Bank of England. *See The Bank of England's Review of MREL*, BANK OF ENG. (Dec. 18, 2020), https://www.bankofengland.co.uk/news/2020/december/boes-review-of-mrel [https://perma.cc/P2N5-RC3Z].

278 *See* Commission Relegated Regulation 2016/1450, arts. 1, 2, 2016 O.J. (L 237) (EU).

279 Chiu & Wilson, *supra* note 261, ch. 8.E.VI.

280 For an overview of the concepts underlying DIS, see FIN. STABILITY BD., THEMATIC REVIEW ON DEPOSIT INSURANCE SYSTEMS PEER REVIEW REPORT60-63 (2012).

deposit insurance: First, depositors whose claims are insured against the default of banks have less reason to distrust banks and to run if financial difficulties become visible.[281] DIS thereby contribute to financial stability as they make banks less prone to sudden large-scale liquidity outflows. Second, retail investors use deposit accounts as primary store of value facilities and suffer existential losses if banks default on their repayment obligations.[282]

In an unlimited CBDE model, neither of these concerns exist any longer. CBDE are the liability of the central banks that form the Eurosystem and are no different from any other form of central bank money.[283] As such, CBDE are default-proof[284] because central banks are not subject to the rules of insolvency.[285] Central banks also never become illiquid because they can create all the liquidity they require without any need for counter-financing.[286] With their unlimited access to CBDE, retail depositors acquire a more solid position than under the current regime that relies on DIS because a DIS might—at least in theory when a very large bank or a group of banks collapses—default on its promise to indemnify retail depositors.[287]

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281 Deposit guarantee schemes reduce incentives for mass withdrawals when depositors see signs of risks from the principle of fractional reserves materialize. *See* Lastra, *supra* note 234, at 63-64.

282 *See e.g.*, Patrizia Baudino et al., *Bank Failure Management—The Role of Deposit Insurance*, 17 FSI INSIGHTS ON POL'Y IMPLEMENTATION 1, 2-3 (2019) (the purposes that regulators pursue with DIS); Sandra Booysen, *Deposit Insurance in Singapore: Why Have It, Who Gets It, How Does It Work?*, SING. J. LEGAL STUD. 76, 88-90 (2013).

283 *See* EUR. CENT. BANK, *supra* note 2, at 6 (generally accepted principles of CBDE); BANK OF ENG., *supra* note 3, at 35.

284 EUR. CENT. BANK, *supra* note 266, at 7, 10.

285 Insolvency principles and proceedings only apply to private law subjects. Central banks can become balance sheet "insolvent" when their assets drop in value, for example, because of exchange rate fluctuations when central banks hold large amounts of foreign currency-denominated assets. As long as these instances of "negative capital" are of a temporary nature, the reputation of the currency and of the central bank as its guardian does not suffer. *See* Christian Hofmann, *Reconsidering Central Bank Lending of Last Resort*, 19 EUR. BUS. ORG. L. REV. 883, 891 (2018); Hanna Armelius et al., *Is Central Bank Currency Fundamental to the Monetary System?*, 2 SVERIGES RIKSBANK ECON. REV. 19, 25 (2020).

286 Zellweger-Gutknecht et al., *supra* note 145, at 11-12.

287 For example, the situation in Iceland, which decided only to compensate its own citizens and to exclude deposits in its foreign branches uncompensated. *See* EFTA Court Judgment in Case E-16/11, 2013 O.J. (C 132); EMILIOS AVGOULEAS, GOVERNANCE OF GLOBAL FINANCIAL MARKETS 209, 247-48 (2012); Paul L. Davies, *Resolution of Cross-border Groups*, *in* RESEARCH HANDBOOK ON CRISIS MANAGEMENT IN THE BANKING SECTOR 261, 263 (Matthias Haentjens & Bob Wessels eds., 2015); Jay Westbrook, *SIFIs*

Better even, retail depositors can decide to what extent they value this infallible position and choose how much of their money they wish to store in CBDE accounts and how much to invest in riskier projects intermediated by the financial sector. The result is that the principle of self-determination that governs all types of financial decisions can be extended to the most essential form of store of value. Cautious retail customers will store larger shares of their money in CBDE accounts, risk-takers less in the same way as they can decide to store more or less money in deposit accounts versus moving their funds in uninsured investment products. Deposits with commercial banks will become one such unguaranteed and therefore moderately risky investment option. There is no longer any need for an insurance because deposit accounts with commercial banks will no longer be the most basic and essential option for store of value and access to cashless payment transactions.

DIS can be abolished, which is a welcome though apparently radical development, since DIS are inefficient yet currently unavoidable regulatory mechanisms. The moral hazards associated with DIS have been broadly discussed in literature.[288] The abolition of DIS relieves banks of the obligation to make regular or ad hoc contributions as this collective good is superseded in necessity by the provision of CBDE. This can be a significant cost-reducing factor for commercial banks in their business transformation strategies. Contributions made by banks to DIS take liquidity out of the banking system which could be used in better ways than to secure potential defaults of one or several of the scheme members.[289]

D. Adjustment of the Regulatory Architecture in the EU? Particular Benefits of the Deregulatory Agenda for the Euro-area

Hardly any other region of the world stands to gain more from deregulation than the Euro-area. The EU's regulatory system is

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and States, 49 TEX. INT' L.J. 329, 337, 353 (2014).

288 *See, e.g.*, INTERNATIONAL ASSOCIATION OF DEPOSIT INSURERS, ENHANCED GUIDANCE FOR EFFECTIVE DEPOSIT INSURANCE SYSTEMS: MITIGATING MORAL HAZARD 7 (2013); *see also* PATRICIA A MCCOY, THE MORAL HAZARD IMPLICATIONS OF DEPOSIT INSURANCE: THEORY AND EVIDENCE 9-13 (2006).

289 For the disadvantages of ex ante-funding principles of DIS, see Booysen, *supra* note 282, at 88-90.

probably the most complex in the world resulting from the facts that twenty-seven countries share an internal market in which capital moves freely and that the passporting principle allows financial intermediaries authorized in one member state to operate throughout the internal market without further licensing requirements.[290] Nineteen of these twenty-seven member states are part of the currency union that shares the Euro and thereby form the Euro-area. The global financial crisis of 2007-2009 showed up the weaknesses of an internal market for banking and financial services that had not been adequately subject to the same levels of prudential supervision, common recovery and resolution standards as well as sufficiently robust DIS.[291] To this end, regulatory ratcheting occurred resulting in the state of the "iron law" we discussed in Part I. The "iron law" not only exists in terms of regulatory standards and frameworks as discussed above but is also implemented by a heavy suite of new regulatory and supervisory architecture that was established post-crisis.

As discussed in Section II.B.1, to improve supervisory monitoring of the activities of banks operating in the internal market, the ECB now centrally supervises all SIBs with the support of the NCAs of the Euro-area member states.[292] Correspondingly, the resolution powers over all SIBs are consolidated in the SRB.[293]

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290 Council Directive 2013/36, art. 17, 2013 O.J. (L 176) 357 (EU); *see also* Council Directive 2013/36, pmbl. 19, 2013 O.J. (L 176) 340 (EU).

291 *See* DE LAROSIÈRE, *supra* note 40, at 6.

292 *See generally* Council Regulation 1024/2013, 2013 O.J. (L 287) (EU); European Central Bank Regulation 468/2014, 2014 O.J. (L 141) (EU) (SSM framework regulation); Eddy Wymeersch, *The Single Supervisory Mechanism or "SSM," Part One of the Banking Union* 1 (Eur. Corp. Governance Inst., Law Working Paper No. 240/2014, 2014); Eilis Ferran & Valia Babis, *The European Single Supervisory Mechanism*, 13 J. CORP. L. STUD. 1, 255 (2013).

293 The SRB is an EU agency with legal personality established to ensure the coherent and uniform application of the SRM. *See* Lastra, *supra* note 255, ¶ 10.48. George S. Zavvos & Stella Kaltsouni, *The Single Resolution Mechanism in the European Banking Union: Legal Foundation, Governance Structure and Financing*, *in* RESEARCH HANDBOOK ON CRISIS MANAGEMENT IN THE BANKING SECTOR 117, 126-30 (Matthias Haentjens & Bob Wessels eds., 2015); *see also* Karsten Paetzmann, *Bad Assets Options and Bank Resolution in Europe: Lessons Learned in and After the 2008 Financial Crisis*, 16 J. RISK FIN. 486, 488 (2015). In the EU countries that remain outside of the Euro-area, the resolution powers are vested in the national resolution authorities. Resolution authorities are set up in accordance with BRRD, *supra* note 8, art. 3. For the full list of national resolution authorities (including the members of the European Economic Area), see*Resolution Authorities*, EUR. BANKING AUTH., https://www.eba.europa.eu/about-

On one hand, harmonization of legislation and regulation can be regarded as a grand achievement that facilitates financial services throughout the EU and should make them cheaper and more efficient. Simultaneously, the recent centralization of supervisory powers in the ECB and the accumulation of resolution powers in the SRB help overcome inefficiencies of fragmented authorities stemming from well-researched phenomena such as national bias, insufficient information exchange, and power struggles between giant financial institutions and understaffed authorities.[294] However, these achievements come at a price. The ECB's manpower had to be doubled with the creation of the SSM.[295] The ECB forms Joint Supervisory Teams consisting of staff from the ECB and the NCAs, and their monitoring tasks have not become less complex in the monitoring of the Euro-area's SIBs.[296] The same applies in resolution matters. With the SRB, the Euro-area created an expensive institution whose authority is limited. Only when the ECB, as the competent supervisor of SIBs, arrives at the conclusion that a bank is failing do they refer the case to the SRB, which applies resolution measures if finding that resolution actions are necessary. Since the SRB's inauguration, there has only been one such case.[297] In all other instances, the SRB has referred to the national authorities of the respective Euro-area member state which rescued the bank with state aid or dissolved it in accordance with ordinary insolvency principles.[298]

Resolution funding mechanisms fund recapitalizations of banks in resolution as well as the administrative expenses of resolution proceedings, including the SRB's, and are burdensome and

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us/organisation/resolution-committee/resolution-authorities [https://perma.cc/P73W-JQ6F] (last visited Nov. 28, 2022).

294 *See* Westbrook, *supra* note 287, at 330.

295 Alex Barker & Michael Steen, *ECB Told to Double Its Manpower*, FIN. TIMES (Feb. 4, 2013), https://www.ft.com/content/8c178adc-6ed4-11e2-8189-00144feab49a [https://perma.cc/S7J6-9ZE6].

296 For details on the Joint Supervisory Teams, see European Central Bank Regulation 468/2014, arts. 3-18, 2014 O.J. (L 141) (EU); Klaus Lackhoff, *The Framework Regulation for the Single Supervisory Mechanism (SSM)—An Overview*, 29 J. INT'L BANKING L. & REGUL. 498, 509 (2014).

297 In 2017, the SRB decided to transfer all shares and capital instruments of Banco Popular Español S.A. (Banco Popular) to Banco Santander S.A (Santander). *See* Single Resolution Board Decision No. 2017/08, 2017 O.J. (C 222) (EU).

298 *Cases*, SINGLE RESOL. BD., https://www.srb.europa.eu/en/cases [https://perma.cc/7WM8-D574] (last visited Sept. 26, 2022).

expensive in the Euro-area. The EU calls its concept of a resolution funding mechanism a "resolution financing arrangement."[299] Every EU Member State is required to establish such an arrangement for its banking sector[300] and must target a minimum amount of available funding of 1% of covered deposits held by all banks authorized to operate within its territory by the end of 2024.[301] The arrangements must be financed by a mix of annual ex-ante and extraordinary ex-post contributions. Individual ex-ante contributions are calculated on the basis of liabilities and risk exposures.[302] Up to 30% of the industry's ex-ante contributions can consist of irrevocable payment commitments fully backed by collateral.[303] All Euro-area member states have merged their individual resolution financing mechanisms into a joint funding mechanisms called the Single Resolution Fund (SRF),[304] thereby triggering additional expenses on the Euro-area level for the administration of yet another shared institution.

Further, a proliferation of European regulatory agencies has occurred under the establishment of the ESFS.[305] This System includes the European Banking Authority (EBA) which has indefatigably produced rulebooks of increasing detail for compliance purposes.[306] Compliance costs at European banks have

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299 For the details of the resolution financing arrangements, see BRRD, *supra* note 8, arts. 100-09. For details on the arrangements, see Lastra, *supra* note 282, ¶¶ 10.55-10.58.

300 BRRD, *supra* note 8, art. 100.

301 By Dec. 31, 2024. *See id*. art. 102(1).

302 *Id*. art. 103(1), (7). Capital and covered deposits are not counted toward the banks' liabilities. *See id*. art. 103(2).

303 BRRD, *supra* note 8, art. 103(3).

304 Lastra, *supra* note 282, ¶¶ 10.55-10.58; Zavvos & Kaltsouni, *supra* note 293, at 139-41.

305 Comprising of EU regulatory agencies that oversee national regulatory agencies in respect of key financial sector activities. *See* Wymeersch, *supra* note 42, at 449-59; *see generally* Chiu, *supra* note 43; Eilis Ferran, *Understanding the New Institutional Architecture of EU Financial Market Supervision*, *in* FINANCIAL REGULATION AND SUPERVISION: A POST-CRISIS ANALYSIS 111-58 (Eddy Wymeersch et al. eds., 2012) (reviewing the new regime of regulatory and supervisory bodies in the EU); Carmine Di Noia & Maria Chiara Furlò, *The New Structure of Financial Supervision in Europe: What's Next?*, *in* FINANCIAL REGULATION AND SUPERVISION: A POST-CRISIS ANALYSIS 172-92 (Eddy Wymeersch et al. eds., 2012) (reviewing new EU financial supervisory structure and recommending improvements for future governance).

306 The EBA hosts the Single Rulebook which comprises the primary and secondary legislation relevant to EU bank regulation and supervision, but the proliferation of binding standards and guidelines is phenomenal. For the number of guidelines exceeding the

increased more than eight-fold[307] while supervisory convergence remains a work in progress. Much cost is incurred in achieving supervisory convergence as the EBA oversees national regulators in order to transcend beyond fragmented levels of national supervisory agendas and effectiveness. The recent scandals with Danske Bank[308] and Wirecard[309] illustrate the challenges that are associated with resources needed for constructing a grand, harmonized and convergent supervisory architecture that can achieve real legal consistency and certainty in regulatory implementation.

Overall and most importantly, the sunk costs of investment in the construction of this extensive regulatory architecture do not seem to be "recouped" by the business performance of the banking sector. We have discussed in Part I findings that EU banks, especially Euro-area banks, are less profitable than their counterparts in other parts of the world. This shows weaknesses in stress tests and continue to lose market shares outside of the EU and even in their home jurisdictions.

We are not asserting that the Euro-area's complex and costly regulatory and supervisory architecture is the cause of such underperformance, but such underperformance requires us to revisit options for change and improvement in both substantive regulation and regulatory architecture. Hence, we argue that the introduction of unlimited CBDE in the Euro-area provides an opportunity that would lead to significant and positive changes in the financial landscape both in the sense of business opportunities as well as relating to unshackling or simplifying regulatory requirements such as prudential regulation and recovery and resolution planning. If the proposed deregulatory agenda is adopted, this could in turn prompt

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numbers of legislative instruments in relation to credit risk regulation, for example, see *Credit Risk*, EUR. BANKING AUTH., https://www.eba.europa.eu/regulation-and-policy/credit-risk [https://perma.cc/85D4-8N7C] (last visited Nov. 28, 2022).

307 CTR. FOR EUR. POL'Y STUD., EUR. COMM'N., STUDY ON THE COSTS OF COMPLIANCE FOR THE FINANCIAL SECTOR 9 (2019).

308 Jim Brunsden, *EBA Faces Calls to Reform After Dropping Danske Bank Probe*, FIN. TIMES (Apr. 28, 2019), https://www.ft.com/content/377f4b60-698f-11e9-80c7-60ee53e6681d [https://perma.cc/GA8D-6QPH].

309 The Wirecard insolvency happened under the German regulator BaFin's watch, and the European agency responsible for oversight of national regulators (European Securities and Markets Authority) could only carry out an ex-post investigation. *See* Huw Jones & John O'Donnell, *EU Watchdog Slams Germany for Lapses in Wirecard Fraud*, REUTERS (Nov. 3, 2020), https://www.reuters.com/article/us-wirecard-accounts-esma-idUKKBN27J0S8 [https://perma.cc/9B3E-LQQN].

reforms that simplify the structures of supervisory and resolution authorities.

The next Part turns to how an unlimited CBDE model would give rise to new financial business opportunities. We also discuss new regulatory implications that would arise. Hence, even as this Part argues for a deregulatory agenda that would facilitate the modernization of profitable banking and financial intermediation, new regulatory needs are not ignored. These require holistic stock-taking of the nature of risks and intermediation by bank and non-bank entities in new forms of credit and investment intermediation, as mentioned earlier. In this manner, even as we welcome changes in the banking and financial markets in favor of innovation and competition there remains a need to consider regulatory recalibration, which is beyond the scope of this article. We envisage that such regulatory recalibration, in addition to the deregulatory agenda discussed above, is likely to pave the way for a more coherent and level playing field for banks and non-bank entities in credit and investment intermediation.

IV. The System for Unlimited CBDE and New Regulatory Implications

This Part discusses how the unlimited CBDE issuance model can be institutionalized and designed. It considers the changes in services and the landscape of service providers this may entail and provides a blueprint for new regulatory implications.

In designing the system for issuance of CBDC, central bankers have pondered over "account-based" or "token-based" designs.[310] An account-based design means that access to CBDE is via a personal account, hence, identification and verification would be necessary conditions for access.[311] An account-based design needs to be caretaken by intermediaries who are authorized, regulated, and

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310 *See* Christian Barontini & Henry Holden, *Proceeding with Caution: A Survey on Central Bank Digital Currency* 1, 2 (Bank for In'tl Settlements, BIS Papers No. 101, 2019); *see also* Tommaso Mancini-Griffoli et al., *Casting Light on Central Bank Digital Currency*, *in* CRYPTOASSETS: LEGAL, REGULATORY, AND MONETARY PERSPECTIVES 307, 309-10, 329-30 (Chris Brummer ed., 2018). No clear design choices have been definitively made for the digital euro. *See, e.g.*, BRUNNERMEIER & LANDAU, *supra* note 148, at 43-44.

311 EU BLOCKCHAIN OBSERVATORY & FORUM, EUR. COMM'N, CENTRAL BANK DIGITAL CURRENCIES AND A EURO FOR THE FUTURE 62 (2021) (discussing that this can still be compatible with privacy concerns in relation to restraints on data sharing).

equipped to carry out account provision and safekeeping.[312] Such intermediaries are therefore likely to attract regulatory standards in relation to onboarding as well as safeguarding the account against unauthorized use. Such intermediaries would owe conduct of business duties to account holders and obligations of accountability and compliance to regulators. A drawback with account-based designs is that account holders' activities are information that can be seen by account-servicing intermediaries and perhaps the regulator and/or central bank, hence protection of privacy needs to be addressed.[313]

In a token-based design, the CBDE is intended to work more like cash, so that digital tokens can be withdrawn into non-custodial devices or "wallets."[314] Although token holders' remittance or spending actions can be observed on relevant networks, privacy may be better supported[315] as payment data may be separated from token holders' personal and financial information. Token-based designs may be more friendly to protecting privacy, but they require users to adopt responsibility for token safekeeping, such as avoiding carelessness or loss of access keys to tokens held in non-custodial devices or wallets.

We argue that in order to support an unlimited issuance CBDE model both designs should be offered and a framework put in place for them to work alongside each other. This is because an unlimited issuance model should be positioned to support a full range of economic and financial activities, and some activities are best supported by account-based interactions, others by token-based interactions. For example, large remittances are best supported by account-based designs as the caretaking and gatekeeping obligations on the part of an account-servicing intermediary provide greater protection for users who wish such transactions to be executed correctly, safely, and attaining finality. Token designs support the need for smart payments. We can think of three

312 *Cf*. Council Directive 2015/2366, 2015 O.J. (L 337) (EU).

313 *See* Jonas Gross et al., *Designing a Central Bank Digital Currency with Support for Cash-like Privacy* 1 (Jul. 22, 2021), https://ssrn.com/abstract=3891121 [https://perma.cc/SX24-KDY5].

314 *See* Wagner et al., *supra* note 147, at 173-75(discussing digital tokens intended to be withdrawn into non-custodial devices or wallets).

315 Paulo R. Cunha et al., *From Bitcoin to Central Bank Digital Currencies: Making Sense of the Digital Money Revolution*, 13 FUTURE INTERNET 165, 177 (2021).

examples where token-based designs enable quick and automated payments and correspond with users' interest in not having such payments interact with an account, thereby also reducing the risk of cyber-hacking and compromise of security.

Token-based designs can work well with smart devices. For example, devices that enable a road toll to be paid on the go or for charging an electric car at an unmanned station. Token holdings in a device or wallet also work well with an Internet of Things (IoT) economy[316] as the token custodial device or wallet can be connected to IoT devices with pre-programmed instructions on purchases and payments. Token-based devices or wallets can also be connected to private platforms such as peer-to-peer goods and services platforms[317] or social media platforms, in order to make peer-to-peer payments or micropayments. It would take token-based designs to the next level to consider how tokens can be coded in ways that allow them to be programmable or interoperable with permissionless blockchains[318] that host a variety of alternative peer-to-peer commercial activities such as gaming. Programmable tokens may be able to work with applications that are open source or permissionless, whereas account-based interactions may require far more heavy lifting in terms of instituting an open or compatible architecture on the part of many private sector commercial entities. However, tokenization standards and interoperability remain issues that need to be addressed in order to see if CBDE can be deployed in alternative commerce such as on permissionless blockchains and the "crypto-economy."[319]

A. Opportunities and Regulatory Implications for Account-based CBDE Services

In our proposed unlimited CBDE issuance model, CBDE accounts can be offered in competition with deposit accounts. It has

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316 Bechtel et al., *supra* note 156, at 26.

317 *See* Geoffrey Goodell et al., *A Digital Currency Architecture for Privacy and Owner Custodianship*, 13 FUTURE INTERNET 130 (2021); *see* Karin Thrasher, *The Privacy Cost of Currency*, 42 MICH. J. INT'L L. 403, 417, 421 (2021).

318 *See generally* Bechtel et al., *supra* note 156, at 26.

319 For a proposal to integrate central bank digital currency with permissionless blockchains, see Iris H-Y Chiu, *Central Bank Digital Currency for the Crypto-economy: An Experimental Proposal Based on the European Single Market and Institution-building*, 51 CAL. W. INT'L L.J. 253, 262 (2021).

been earlier mooted[320] that CBDE accounts could be directly based at the central bank, this logically extending from the public good nature of the storage of value service to be provided for citizens. However, commentators have pointed out that an exponential rise in the number of accounts with central banks may be unmanageable in the Eurosystem,[321] in addition to the unease central banks would have with customer management and interfaces,[322] such a role being likely performed better by the private sector that is more experienced with customer onboarding and management.[323] Recent policy discussions[324] now envisage that an account-based design would involve the private sector, and new architecture would be required to be built out for such account hosting, account interactions and plugging into the central bank's settlement system. Technically speaking, this may be no different from a deposit account. However, from a legal perspective such account holders are clearly better off with claims against central banks as compared to private entities.

But even technically speaking, the industry for providing and caretaking CBDE accounts open up opportunities to new competition and innovation in financial services. Service providers can layer upon caretaker, customer and gatekeeping services to provide customers with access to other financial or investment services.[325] We envisage that existing banks and electronic money institutions, familiar with providing account-based services, could enter this field, but equally this field is open to Fintechs that engage with centralized management of accounts, such as Revolut[326] or

320 *See* Hossein Nabilou & André Prüm, *Central Banks and Regulation of Cryptocurrencies* 19-23 (Univ. of Luxembourg, Law Working Paper No. 2019-014, 2019) (arguing that direct regulation of cryptocurrencies by central banks may not be desirable or even possible).

321 *See* Bindseil, *supra* note 128, at 304 (opining that number of accounts with central banks would arise from around 10,000 to hundreds of millions).

322 Harry Leinonen, *Electronic Central Bank Cash: To Be or Not to Be?*, 13 J. PAYMENTS STRATEGY & SYS. 20, 27 (2019).

323 *See* BANK FOR INT'L SETTLEMENTS, REP. NO. 2, CENTRAL BANK DIGITAL CURRENCIES: SYSTEM DESIGN AND INTEROPERABILITY 3 (2021).

324 *See id*.; EU BLOCKCHAIN OBSERVATORY & FORUM, https://www.eublockchainforum.eu/ [https://perma.cc/65AF-E8HP] (last visited Nov. 28, 2022); *see also* BANK OF ENG., *supra* note 3, at 23.

325 BANK OF ENG., *supra* note 3, at 22-24.

326 REVOLUT, https://www.revolut.com/ [https://perma.cc/D4FC-KMWP] (last visited Nov. 28, 2022).

Coinbase.[327] We envisage that credit can be withdrawn from deposits into CBDE accounts to begin with, thereby converting a bank liability into a central bank liability, and CBDE tokens can be further withdrawn into non-custodial devices, as we discuss shortly. Remuneration must be expected for account-based service providers or else there would be no incentives for them to offer services and innovate in this landscape,[328] but it remains to be seen whether providers will charge account holders directly or whether CBDE-accepting merchants will shoulder these expenses in ways similar to payment card-accepting merchants which pay fees calculated as percentiles of the payment amounts (disagios). In any case, there may be a need for the central bank and/or relevant regulator to keep an eye on the likely cost of private sector services to customers, and competition authorities may be required to intervene if price cartels form as it happened among payment card-issuers.[329] Further, CBDE must always remain a claim on the central bank rather than on a private sector provider of a deposit account. Hence, bespoke regulatory standards are envisaged to be applicable to such service providers, and the central bank—being the account holder's debtor—has an interest in maintaining a full view of the CBDE ledger in relation to its clearing and settlement roles.

In particular, it is envisaged that regulatory implications should be based on the following regulatory principles[330] consistent with those in EU financial regulation generally:

(a) authorization to provide services;

(b) protocols and standards for all transactions;

(c) customer protection and legal duties;

(d) duties with relation to maintenance of the infrastructure;

(e) data governance and protection.

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327 COINBASE, https://www.coinbase.com/ [https://perma.cc/4WVX-AUKC] (last visited Nov. 28, 2022).

328 However, this raises financial inclusion issues, as fees and the need for an account can be impeding for the financially marginalized. *See* Diego Zuluaga, *Which Type of Digital Currency for Financial Inclusion?*, 41 CATO J. 413, 415 (2021).

329 *See* Press Release, Eur. Comm'n, Antitrust: Commission Fines Mastercard €570 Million for Obstructing Merchants' Access to Cross-border Card Payment Services (Jan. 22, 2019), https://ec.europa.eu/commission/presscorner/detail/en/IP_19_582 [https://perma.cc/97A4-E8QS].

330 *See* Council Directive 2014/65, 2014 O.J. (L 173) (EU) (representing the financial regulatory principles of the EU generally).

Account-based service providers should, like all financial institutions, be subject to an authorization regime in order to provide services. The requirements for the authorization of account-based service providers should be unique and not (wholly) derived from the requirements for conventional financial sector services (such as electronic money or card-based payment services).[331] In particular, authorization should include the criterion that the applicant has adequate precautions for the sound management of technological risks in place. Account-based service providers should, like other financial institutions, be subject to adequate standards of governance integrity, internal control, business continuity planning,[332] and be accountable to the Eurosystem.

Further, the Eurosystem and relevant financial services regulators should determine their supervisory remits and coordination over CBDE account-based service providers,[333] and in particular prescribe the protocols and standards for account-based interactions. These can also be co-developed with private sector providers, including the wallet industry, as discussed below, so that CBDE transfers can be based on standards that apply equally to account or token-based service providers. The Eurosystem should also determine if a centralized ledger for settlement and clearing should be adopted or whether a distributed ledger is preferred.[334] The latter is not favored in policy discussions at the moment.[335] But even with a centralized ledger, the duties and responsibilities of service providers who are nodes in the system would need to be provided for to ensure robustness in transaction settlement and finality.

In terms of customer protection, account-based service

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331 *See e.g.*, *id.* art 5 (representing authorization requirements for conventional financial services).

332 *Cf.* Council Directive 2014/65, art. 16, 2014 O.J. (L 173) (EU).

333 *See* Chiu, *supra* note 319, at 60 (discussing how digital innovation in Europe may bring about the need for new thinking regarding regulatory architecture and coordination between agencies).

334 Which ledger is adopted raises issues in relation to the operation of a permissioned or permissionless system and the governance of such systems. *See generally* Jean Bacon et al., *Blockchain Demystified: A Technical and Legal Introduction to Distributed and Centralised Ledgers*, 25 RICH. J. L. & TECH. 1 (2018).

335 EUR. CENT. BANK, *supra* note 2, ¶ 6.1; Bindseil, *supra* note 128, at 304; BRUNNERMEIR & LANDAU, *supra* note 148, at 43-44; BD. OF GOVERNORS, *supra* note 1, at 13-14.

providers should be subject to duties that draw on similar principles as payment service providers at the moment.[336] Customer protection standards in terms of account security protection and gatekeeping against financial crime or misuse should be in place.[337] Such standards can in part be derived from general rules in the regulation of payment services[338] and anti-money laundering[339] but should also be tailored to the specific risks generated by account-based interfaces. As customers enjoy the unique protection of a risk-free claim on the Eurosystem, there may be a need to consider bespoke rules to ensure that the private sector's provision of custodial safekeeping is consistent with this.

Where account-based service providers also offer other financial services or are part of a larger financial institution, they must put in place management mechanisms for conflicts of interest[340] with cross-provisions to other services. As far as customers have efficient access or choice to access cross-provided services, any conflicts of interest and incentives that may undercut account-based service providers' protection for customers must be appropriately disclosed and managed.[341]

One unique issue for customer protection is that CBDE is a public good, and expectations relevant to this must be safeguarded. Customers should enjoy protection in terms of value for money in accordance with the CBDE as a public good in storage of value services. Consistent with our proposal to frame CBDE as a public good for the Euro-area, CBDE account providers should be mindful of this ethos and regulation should be designed in ways that safeguard this aspect while allowing profit-making opportunities for other financial services beyond the basic level.

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336 *See* CTR. FOR EUR. POL'Y STUD., *supra* note 307.

337 *Id.*

338 *See* Council Directive 2015/2366, 2015 O.J. (L 337) (EU) (payment services).

339 Council Directive 2015/849, 2015 O.J. (L 141) (EU).

340 The EU has always regulated financial firms' conflicts of management conduct. *See* Commission Relegated Regulation 2017/565, art. 23, 2017 O.J. (L 87) (EU) (risk management requirements in relation to investment firms).

341 This area should also be consistent with cross-cutting rules on anti-competitive practices regulated under the proposed Digital Services Act. *See The Digital Services Act: Ensuring a Safe and Accountable Online Environment*, EUR. COMM'N, https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/digital-services-act-ensuring-safe-and-accountable-online-environment_en [https://perma.cc/Z7FV-RYBE] (last visited Nov. 28, 2022).

Finally, the issue of data governance and protection in terms of account-based service providers' use of data and transmission to authorities or third parties must be provided for. Regulation should also address how account-based service providers should safeguard accounts against third-party attacks and data transfers and under what circumstances they are required to provide account-based data to the Eurosystem.[342]

Although we foresee a raft of new regulatory implications as outlined above, which require policymakers to consider unique regulatory frameworks for CBDE and their account-based service providers, regulation is also enabling[343] in nature as it provides the rules of the playing field and the consistent expectations underpinning the transformation of new financial service businesses in this area. Bespoke regulatory policy for CBDE account services must be considered alongside existing regulation for payment services and store of value[344] so that potential inconsistencies and arbitrage may be minimized.[345] We turn next to both the business and regulatory opportunities associated with services that support token-based CBDE holdings.

B. Opportunities and Regulatory Implications for Token-based CBDE Holdings

CBDE can be held in token bearer devices or wallets that directly interact with digital interfaces for points-of-sale. We see this as beneficial for the usage of CBDE, but we do not think that a token-based holding system could work exclusively. Account-based holdings allow for gatekeeper oversight, which is an essential pillar of anti-money laundering surveillance.[346] Hence, a CBDE system that relies exclusively on tokens would raise concerns as to whether the protection of privacy comes at the cost of facilitating financial crime and money laundering.[347] Moreover, liquidity supply is a monetary policy tool of central banks, and central banks are likely

342 *See generally* Council Directive 2015/2366, 2015 O.J. (L 337) (EU).

343 Barak Orbach, *What is Regulation?*, 30 YALE J. ON REG. ONLINE 1, 4 (2012).

344 *See e.g.*, Council Directive 15/2366, 2015 O.J. (L 337) (EU).

345 Inconsistencies in regulating the functional equivalents of payment services have been discussed in relation to the United States. *See* Dan Awrey & Kristin van Zweiten, *The Shadow Payment System*, 43 J. CORP. L. 775, 775 (2018).

346 *See* Council Directive 2015/849, art. 11, 2015 O.J. (L 141) (EU).

347 *See generally* Council Directive 2015/2366, 2015 O.J. (L 337) 42 (EU).

to have a more complete view of CBDE holdings in accounts than in token-based devices. Only an account-based holding system for most of the issued CBDE would assist central banks in determining how to pursue their monetary policy objectives in optimal ways.

Zuluaga has argued that the financially marginalized are often unable to attain financial service accounts, because they may, for example, have no permanent abode of residence, and in this manner, the need to have an account to hold CBDE or access CBDE services can prove exclusionary.[348] Therefore, there is a need to consider whether a basic "post office" type CBDE account should be available to everyone as a public good, but this should be "no frills attached" and should not be layered over with other financial or commercial services. Similar to the right to a basic account in the EU,[349] policymakers should implement an authorization condition for CBDE account-based service providers to offer a free "no frills attached" storage of value service for CBDE.

Although a free storage of value account may not allow users to perform other financial service activities unless with consideration, users should always be allowed to transfer CBDE into non-custodial wallets so that they can carry out onward payment or remittance activities from there. We propose that such transfers should be subject to daily limits in order to combat money laundering. This way, account-based service providers would be able to perform gatekeeping oversight of withdrawals of CBDE if money laundering is suspected. It would bring CBDC account services in line with deposit account services because daily limits for cash withdrawals imposed by banks[350] serve the double function of protecting customers from excessive loss and managing risks of money laundering.

It has been mooted that tokens can be stored on simple "universal access devices"[351] which can be issued to all citizens so that at a touch of a button or initiation of smart sensing, the device

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348 Diego Zuluaga, *Which Type of Digital Currency for Financial Inclusion?*, 41 Cato J. 413, 413-20 (2021).

349 *See* Landgericht Berlin, *supra* note 119.

350 Rebecca Lake & Marc Strohm, *ATM Withdrawal Limits: What You Need to Know*, FORBES (Mar. 11, 2022), https://www.forbes.com/advisor/banking/atm-withdrawal-limits/ [https://perma.cc/6PSH-PCXE].

351 Filippo Zatti & Rosa Giovanna Barresi, *The Importance of Where Central Bank Digital Currencies Are Custodied: Exploring the Need for a Universal Access Device* 2 (Sept. 11, 2021), https://ssrn.com/abstract=3691263 [https://perma.cc/5GR9-FRK6].

can interact with another compatible digital interface for payment or transfer. While it can be argued that such physical devices are cumbersome and incompatible with the goals of a digital economy, the benefits of universal access devices prevail. They support full inclusion of all parts of society, including those without smartphones and other devices usually needed to host the storage of value applications. They also allow users to make offline payments and transactions. In essence, their technical designs are similar to traditional storage devices for electronic money that allow offline transfers from the data chip on the storage device to the chip of the payment collection terminal. Examples are electronic wallets that were introduced by the banking industry in the late 1990s[352] or in-car smart card readers that the Singapore government issues to every car owner to be fixed to their vehicle so that smart payments can automatically be deducted from the stored value in the smart card for road toll.[353] However, such physical devices need to conform to prescribed standards and technical errors should not result in loss to innocent token holders. There is also a need to ascertain that these devices are narrowly purposed and designed to fence off malware that may compromise users' privacy or data.

More commonly, CBDE will be held in wallet applications on smartphones or other personal devices. Existing applications, currently written to support the cryptocurrency industry, are non-custodial in nature,[354] meaning that the wallet application is not serviced by a centralized operator and the user is fully responsible for safekeeping the access keys. For CBDE holdings, wallets could be custodial or non-custodial in nature. Custodial wallets would appear so similar to CBDE-accounts that they should be subject to the same regulatory blueprint addressed earlier.[355] For non-custodial

352 For the concept of an electronic wallet issued (with limited success) by the German banking industry, see generally CHRISTIAN HOFMANN, DIE GELDKARTE—DIE ELEKTRONISCHE GELDORSE DER DEUTSCHEN KREDITWIRTSCHAFT (2001).

353 *New Unit for Next-gen ERP System to Be Installed Free in Existing Vehicles Mid-2021*, YAHOO NEWS (Sept. 8, 2020), https://sg.news.yahoo.com/new-unit-for-nextgen-erp-system-to-be-installed-free-in-existing-vehicles-from-mid-2021-073408782.html [https://perma.cc/94NL-77M6].

354 S*ee e.g.*, METAMASK, https://metamask.io/ [https://perma.cc/C34B-4DTN] (last visited Nov. 28, 2022) (the popular Metamask); *see also*, COINOIMI, https://www.coinomi.com/en/ [https://perma.cc/8TB7-B5YR] (last visited Nov. 28, 2022) (Coinomi, a multi-asset wallets).

355 Sarah J. Hughes & Stephen T. Middlebrook, *Advancing a Framework for Regulating Cryptocurrency Payment Intermediaries*, 32 YALE J. ON REG. 496, 552 (2015);

wallets, there would not be a central operator to which CBDE holders would have recourse in case of loss of keys in any manner, and non-custodial wallet applications often also contain extensive disclaimers for responsibility.[356] Currently, such wallets are often preferred by cryptocurrency holders for privacy reasons,[357] as wallet interactions only contain the essential metadata relating to transfer addresses and transfer amounts, thereby keeping wallet holder's personal and financial information private. There is no conceivable form of customer service between the wallet application provider and the customers. Whether CBDE holders would favor such wallet types for privacy reasons remains to be seen, but the fact that CBDE would represent a public good and the safest store of value option of the public makes it unlikely that many wallet holders would prioritize anonymity over security.

The industry for wallet applications has mushroomed to support different types of cryptocurrency, cryptoassets, etc. and commentators have voiced the need to subject wallet applications to certain regulatory standards in order to ensure customer protection and conformance to anti-money laundering standards.[358] In a self-regulatory state, users are subject to contractual governance which features exclusions and disclaimers.[359] It may be argued that as wallet applications are not centrally managed, regulation cannot attach to particular "responsible" entities to ensure customer protection or anti-money laundering oversight and compliance. For example, the EU's fifth Anti-Money Laundering Directive is not applicable to non-custodial wallet providers.[360] The Directive's modus of regulation relies on the attachment of certain responsibilities such as due diligence to providers of services, based on the assumption that there is a transactional context or provider to

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Dennic Chu, *Broker-dealers for Virtual Currency: Regulating Crypto-wallets and Exchanges*, 118 COLUM. L. REV. 2323, 2327-28 (2018).

356 *See e.g.*, Felipe Erazo, *Crypto User Loses over $100K in Bitcoin While Transferring His Wallet*, BITCOIN (Jan. 9, 2021), https://news.bitcoin.com/crypto-user-loses-over-100k-in-bitcoin-while-transferring-his-wallet/ [https://perma.cc/9T34-JNY8].

357 Goodell et al., *supra* note 317, at 9.

358 Anastasia Solitopoulou & Stephanie Ligot, *Legal Challenges of Cryptocurrencies: Isn't It Time to Regulate the Intermediaries?*, 5 EUR. CO. & FIN. L. REV. 652, 657-80 (2019).

359 *See* BANK OF ENG., *supra* note 3.

360 Council Directive 2015/849, art. 2(a)(3)(h), 2015 O.J. (L 141) (EU) (as amended by Council Directive 2018/843, 2018 O.J. (L 156) (EU)).

customer relationship.[361] However, a user who downloads a non-custodial wallet application is not a "customer" in the conventional sense as these applications are often free, require no account-based information as a prerequisite for download and use, and do not facilitate any "relationship" with the wallet application writer. Further, non-custodial wallet applications are not "active participants" in any transactional context since the applications only run passive and automated protocols. However, in the wake of sanctions against Russia in the Ukraine war which began on February 24, 2022,[362] concerns have been voiced about evasion of sanctions via cryptocurrency transfers and have triggered amendments to anti-money laundering regulation as discussed below.[363]

One way of regulating non-custodial wallets would be by targeting the proximate entities, e.g., the app store platforms that sell these apps. This would be a type of "gatekeeper" regulation where app stores need to verify if wallet apps conform to anti-money laundering standards. However, app providers do not envisage control over customers' use and the low-cost or free provision of wallet apps could be compromised if entity-based regulation were extended to them. Further, app store platforms are unlikely able to vet the merits and specific customer protection implications of financial services apps such as wallet apps, and it may be disproportionate to regulate them for these purposes.[364] Another approach, which the EU intends to pursue with its Markets in Crypto-assets Regulation,[365] is to regulate other regulable entities, such as financial institutions or even commercial entities, that

361 Council Directive 2015/849, art. 11, 2015 O.J. (L 141) (EU).

362 *See e.g.*, *EU Sanctions in Response to Russia's Invasion of Ukraine*, EUR. COUNCIL, https://www.consilium.europa.eu/en/infographics/eu-sanctions-russia-ukraine-invasion/ [https://perma.cc/3D37-NFM5] (last visited Nov. 28, 2022) (infographic depicting individual sanctions).

363 *See* Emily Flitter & David Yaffe-Bellany, *Russia Could Use Cryptocurrency to Blunt the Force of U.S. Sanctions*, N.Y. TIMES (Feb. 24, 2022), https://www.nytimes.com/2022/02/23/business/russia-sanctions-cryptocurrency.html [https://perma.cc/SNP4-DGD9].

364 The EU Digital Markets Act proposes to regulate platforms including app stores for mainly anti-competitive purposes. *The Digital Markets Act: Ensuring Fair and Open Digital Markets*, EUR. COMM'N (Sept. 11, 2022), https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/digital-markets-act-ensuring-fair-and-open-digital-markets_en [https://perma.cc/R3FW-6Z8U].

365 *See supra* note 144 and accompanying text.

receive payments from non-custodial wallets. Under this approach, the payment recipient must ensure that there is traceable information that leads to the originator of the payment or holder of the wallet. In this manner, if recipients cannot ascertain the depth of information of the payor, the transaction must be rejected because legal risks loom. Such transaction frictions would be a means of combatting potential money laundering, as the EU plans to set the threshold amounts for these obligations at EUR 1,000.[366]

For a full range of comprehensive regulation, such as conduct regulation, it may be difficult to regulate by attaching obligations to proximate entities. Perhaps it is time to consider that regulatory standards have to be levied at the point of design, so that wallet applications embed conformance with certain protocols and regulatory standards and have to be design-approved by regulators before they can be offered for free or sold by app stores. Auer has proposed that regulatory designs such as embedding codes with certain legal and compliance standards would have to be explored in highly decentralized and automated interfaces of financial activity.[367] For example, protocols in wallet applications could embed daily transfer limits in order to mitigate the risk of money laundering. In this manner, we support a role for central banks and financial regulators to pre-approve of wallet applications based on code disclosure and testing, where they are intended to provide storage services for CBDE. This may also extend to software updates. The foray into such new scopes and forms of regulation opens up channels for regulators to engage with the cryptocurrency wallet industry more generally,[368] so that such design-based regulation can be extended *ex ante* to application developers.

Further, central banks and financial regulators should also consider the standards of programmability that are needed for CBDE to be deployed in the crypto-economy.[369] In this respect, central banks and financial regulators should consider whether

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366 David Attlee, *EU Parliament Can Outlaw Transacting with "Unhosted" Wallets, Crypto Advocate Warns*, COINTELEGRAPH (Mar. 28, 2022), https://cointelegraph.com/news/eu-parliament-can-outlaw-transacting-with-unhosted-wallets-crypto-advocate-warns [https://perma.cc/2J2U-XUQ7].

367 Raphael Auer, *Embedded Supervision: How to Build Regulation into Decentralised Finance*7-8 (Bank for Int'l Settlements, Working Paper No. 811, 2019).

368 Chiu, *supra* note 319, ch. 6; *see also* Rosa Lastra & Jason Allen, *Virtual Currencies in the Eurosystem: Challenges Ahead*, 52 INT'L LAW. 177, 214 (2018).

369 Chiu, *supra* note 319, ch. 6.

CBDE programmability should be explored with mainstream commercial developers in IoT or platforms, or indeed with crypto-economy developers many of whom work with the Ethereum token templates. There is a broader issue of bringing together coordination amongst a variety of innovators writing in different languages at the moment,[370] in order to explore if token standardization or taxonomies may be viable.[371] This broader agenda may ultimately open up the space between the regulation of payment systems for the conventional economy, and peer-to-peer payment systems that have developed on permissionless blockchains such as bitcoin and Ethereum, in order to consider appropriate regulatory standards and policy[372] for such bottom-up systems that have grown in scale.

Further, as many wallet applications serving the cryptocurrency industry also offer gateways and connections to other applications and providers of services, there needs to be regulatory consideration of whether CBDE wallet applications should be allowed to innovate in a similar manner and what regulatory implications there may be. Central banks and financial regulators should consider: (a) the extent to which wallet applications and other services constitute a centralized form of service provision in order for regulators to compel such operators to convert to an account-based outfit for authorization and ongoing regulatory oversight; and (b) the extent to which wallet applications should embed gatekeeping functions for customer protection in relation to external and third-party services to which they connect. Hence, protocols for connections should also be vetted in order to ensure that they embed sufficient customer protection such as a clear warning that customers are directed to third party services and disclosure of conflicts of interest of the wallet application's management. Central banks and regulators should carefully consider the range of innovations in which wallet applications are permitted to engage and be prepared to map innovations against risks in order to determine an appropriate level of expectation for code developers to provide

370 Such as Solidity being the code language for the Ethereum blockchain, while Facebook was developing its Diem coin in Rust, an open-source language used for Mozilla Firefox. *See* SOLIDITY https://soliditylang.org/ [https://perma.cc/RH35-CK34] (last visited Nov. 28, 2022); COINTELEGRAPH https://cointelegraph.com/news/one-currency-to-rule-them-all-facebook-s-diem-has-global-ambitions [https://perma.cc/3QZ6-KNTQ] (last visited Nov. 28, 2022).

371 *See generally* Pfister, *supra* note 213.

372 Chiu, *supra* note 319, ch. 6.

customer protection and anti-money laundering compliance.

The development of an industry that supports non-custodial holdings of CBDE tokens is likely to facilitate innovations in a smart, digital economy and to provide many opportunities for both financial services transformation and commercial innovation. The above discussion shows the heavy lifting that is required on the part of central banks engaged with the private sector in terms of the requisite technological and regulatory infrastructure. It appears probable that the Digital Europe Programme[373] envisages deep and penetrative technological transformations for the economy and society, hence the endeavors we propose above are not inconsistent. In this manner, it is likely inevitable for central banks and financial regulators to develop new technological capacity and expertise relevant to the ethos of their oversight roles, to provide public goods and ensure a level of financial user protection commensurate with the social contract underpinning their regulatory institutions.

V. Conclusion

Many developed jurisdictions, including the United States, EU and UK are exploring CBDC.[374] Such moves seem to be a needed response to the global race amongst policymakers and central banks to address the surge of cryptocurrency[375] and potential competition over digital dominance among jurisdictions.[376] At the same time, the exact implications of CBDC are unpredictable, and policymakers and central bankers are averse to the risks of "financial

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373 *See The Digital Europe Programme*, EUR. COMM'N, https://digital-strategy.ec.europa.eu/en/activities/digital-programme [https://perma.cc/5M4Z-8BGP] (last visited Nov. 28, 2022).

374 *See supra* notes 1-3 and accompanying text.

375 *See e.g.*, Jason Corbett & Koraphot Jirachocksubsin, *Cryptocurrency Regulation in Thailand*, ASIA BUS. L.J. (2021) (attempts by jurisdictions to legitimize cryptocurrency in Thailand); *see also* PwC, EL SALVADOR LAW: A MEANINGFUL TEST FOR BITCOIN (2021) (El Salvador's initiative to make bitcoin legal tender).

376 *See* Shiraz Jagati, *China's Digital Yuan Develops at Speed, Leaving Dust in Its Path*, COINTELEGRAPH (Jul. 8, 2021), https://cointelegraph.com/news/china-s-digital-yuan-deploys-at-speed-leaving-dust-in-its-path [https://perma.cc/ESW4-PPYS] (pioneers are the digital yuan in China); Qian Yao, *A Systematic Framework to Understand Central Bank Digital Currency*, 61 SCI. CHINA (2018); *see also* Jim Wyss, *How the Tiny Bahamas Beat Global Giants in the E-currency Race*, FIN. TIMES (May 20, 2021), https://financialpost.com/pmn/business-pmn/how-the-tiny-bahamas-beat-global-giants-in-the-e-currency-race [https://perma.cc/YS3G-APMC].

disintermediation" and their potential stability consequences.[377] Yet, finance is being modernized with digital revolutions and new opportunities, and assumptions regarding financial intermediation as it exists now may not stand.

This article argues for a bold vision, arguably contrary to the conservatism observed in policy papers in the EU,[378] for an unlimited CBDC in the Euro-area. We support such a project in the unique circumstances of the European banking sector which has been underperforming since the end of the global financial crisis of 2007-2009. Further, Euro-area banks have been retreating from the retail market in particular. Shackled to onerous regulatory obligations and aggressive monetary policy by the Eurosystem, Euro-area banks could benefit from a market upheaval that unlimited CBDE would bring.

This development can also be considered by non-Euro-area central banks in relation to addressing the changes observed in their banking sectors. The shift of the provision of the store of value public good from bank deposits to CBDE accounts, which are claims upon the Eurosystem, arguably strengthens the possibilities for financial sector modernization. We argue that the unlimited CBDE is not inconsistent with but, on the contrary, can further the Eurosystem's deployment of monetary policy tools. Further, bank and financial sector transformation can warrant aspects of adjustments and rollbacks of the post-crisis regulatory framework, and these would benefit the sector's business transformation and also pave the way for a more manageable financial stability mandate for the ECB, while creating the opportunity for policymakers to take stock of and consider longer-term, holistic regulatory agendas relevant to bank and non-bank financial intermediation for credit. This agenda would provide a more level playing field for all financial sector entities engaged in similar risks, hence sparing banks from overly onerous regulatory treatment based on assumptions regarding sectoral activities and importance.

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377 *See supra* Section II.A.

378 *See supra* Section II.A

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