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REGULATING STABLECOINS AS PRIVATE MONEY BETWEEN
LIQUIDITY AND SAFETY. THE CASE OF THE EU 'MARKET IN
CRYPTO ASSET' (MICA) REGULATION

Edoardo D. Martino

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REGULATING STABLECOINS AS PRIVATE MONEY BETWEEN LIQUIDITY AND SAFETY

The Case of the EU 'Market in Crypto Asset' (MiCA) Regulation

Edoardo D Martino[†]

ABSTRACT

Stablecoins are crypto assets that purport to maintain a stable value by referencing other physical or financial assets. Stablecoins are attracting considerable attention as a new way of creating private money.

This article analyses the financial stability concerns surrounding stablecoins, specifically looking at liquidity risk and demonstrates that the applicable legal framework shapes such concerns.

This finding is based on two main arguments. First, there is a trade-off between the different regulatory goals, namely promoting innovation, protecting investors, and safeguarding financial stability. This posits that the policymaker cannot achieve these three goals simultaneously but can only prioritize two. Second, the article shows that the liquidity risk inherent in stablecoins can be bolstered by a regulatory framework promoting financial innovation and investor protection, especially when it comes to the requirements on the reserve assets and the withdrawal rights of token holders.

This framework is applied to the European 'Market in Crypto Asset' (MiCA) Regulation. The analysis highlights that MiCA focuses on investor protection and promoting innovation, whereas financial stability remains in the background. This generates incentives increasing the risk of a run on stablecoin should liquidity dry up, making stablecoins a source of vulnerability for financial stability in the coming years.

Keywords: stablecoin, money market funds, liquidity, run, financial stability, MiCA

JEL Codes: G23; G28; K23

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1. Introduction

Finance is an ever-evolving industry where innovation is and has always been fast.¹ However, the widespread feeling is that finance, coupled with recent digital technologies, has started to evolve at an unprecedented pace both in terms of the number and depth of innovations.² Another common refrain is that regulators and policymakers are lagging and that they lack appropriate tools and experience to tackle these new and unprecedented challenges.³

To a large extent, this holds true. However, this article contends that for much we do not know, there is also a lot we already know.⁴ Specifically, it shows that stablecoins are a new and technologically advanced form of private money – a phenomenon known for centuries.⁵

From a regulatory standpoint, most of what we know was learnt the “hard way” in the distant or recent past.⁶ Academics and policymakers should not be blinded by new technologies applied to new forms of financial intermediation and forget lessons already learnt.⁷ The history of private money teaches us that allowing stablecoin issuers to guarantee both the principal amount and the liquidity of a claim without a serious regulatory framework is a good recipe for generating or boosting

¹ For a theoretical overview of “financial innovation”, see P. Tufano, "Financial Innovation" in G. M. Constantinides, M. Harris, R. M. Stulz (eds) *Handbook of the Economics of Finance* (Amsterdam: Elsevier, 2003) 307.

² On the concept of depth, see J.W. Schindler. "FinTech and Financial Innovation: Drivers and Depth" (Finance and Economics Discussion Series 2017-081. Washington: Board of Governors of the Federal Reserve System, 2017) at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3029731 (last visited 30.08.2022).

³ The references here are numerous. On the necessity to adopt technological innovation, so-called “Reg-Tech” in regulating financial technology, see D. W. Arner, J. Barberis and R. P. Buckley, "FinTech, RegTech, and the Reconceptualization of Financial Regulation" (2016) 37 *Northwestern Journal of International Law & Business* 371. On the need to establish “regulatory sandboxes” to test how regulation and innovation can positively interact, see H. J. Allen, "Regulatory Sandboxes" (2019) 87 *Geo. Wash. L. Rev.* 579; R. P. Buckley and others, "Building FinTech Ecosystems: Regulatory Sandboxes, Innovation Hubs and Beyond" (2020) 61 *Wash UJL & Pol’y* 55.

⁴ Arnoud Boot and others, "Fintech: What’s Old, What’s New?" (2021) 53 *J Financ Stabil*, 100836.

⁵ Bart Stellinga et al., "The History of Money Creation", in *Money and Debt: The Public Role of Banks* (Springer 2021).

⁶ C. Reinhart and K. Rogoff, *This Time Is Different: Eight Centuries of Financial Folly* (Princeton: Princeton University Press, 2009); A. Tooze, *Crashed: How a Decade of Financial Crises Changed the World* (London: Penguin 2018).

⁷ For a critique of the current hype on the concept of “financial disintermediation”, see F. Kaja, E. Martino and A. M. Paces, "FinTech and the Law and Economics of Disintermediation", in I. Chiu and G. Deipenbrock (eds.) *Routledge Handbook of Financial Technology and Law* (London: Routledge, 2021).

financial crises.⁸ This lesson should inform the current debate on the regulation of stablecoins.⁹

So far, most of the debate on regulating stablecoins has focused on two main issues. On the one hand, the disruptive impact of ambitious stablecoin projects, such as Facebook Diem,¹⁰ on payment systems and monetary policy.¹¹ On the other hand, the need to protect perspective consumers and society from potentially abusive behaviours of stablecoin providers so as to preserve market integrity and foster innovation.¹²

This article highlights the additional element of financial stability, discussing the implications of stablecoins from the perspective of liquidity risk.¹³ In so doing, the article brings a fresh view on traditional issues in economics and finance, such as liquidity and its regulation.¹⁴ Fresh insofar as it highlights an aspect too neglected in the current debate on stablecoins and, in general, an aspect that is too often overlooked in legal scholarship. Traditional because it is grounded on the analysis of phenomena and regulatory practices that have long been known.¹⁵

Based on these premises, the article argues that stablecoins share fundamental features with money market funds (MMFs). Both “purport”¹⁶ to guarantee the

⁸ D. Awrey, "Bad Money" (2020) 106 Cornell L Rev 1.

⁹ Defined as “A crypto-asset that aims to maintain a stable value relative to a specified asset, or a pool or basket of assets”. See Financial Stability Board “Regulation, Supervision and Oversight of “Global Stablecoin” Arrangements - Final Report and High-Level Recommendations” (2020), 5 at <https://www.fsb.org/wp-content/uploads/P131020-3.pdf> (last visited 30.08.2022).

¹⁰ Previously known as Libra, now retracted.

¹¹ See, for instance, D. Zetzsche, R. Buckley and D. Arner, "Regulating LIBRA: The Transformative Potential of Facebook’s Cryptocurrency and Possible Regulatory Responses" (European Banking Institute Working Paper Series 2019/44, 2019) at https://papers.ssrn.com/sol3/Papers.cfm?abstract_id=3414401 (last visited 30.08.2022); D. Arner, R. Auer and J. Frost, "Stablecoins: Risks, Potential and Regulation" (2020) 39 *Financial Stability Review* 95.

¹² Arner, Auer and Frost, n 11, 99.

¹³ The FSB recently acknowledged the financial stability risk inherent in stablecoins. See Financial Stability Board, “Assessment of Risks to Financial Stability from Crypto-Assets” (2022) at <https://www.fsb.org/wp-content/uploads/P160222.pdf> (last visited 30.08.2022). However, the document mainly focuses on monetary policy and payment infrastructure.

¹⁴ For a similar argument, see G. Gorton and J. Zhang, “Taming Wildcat Stablecoins” (2022) 90 U. Chi L Rev, forthcoming.

¹⁵ M. Brunnermeier and L. Pedersen, "Market Liquidity and Funding Liquidity" (2009) 22 Rev Financ Stud 2201.

¹⁶ The term “purport” is used in many international documents and the Regulation itself when indicating that the purpose of stablecoins is to maintain a stable value based on specific stabilisation mechanisms. See Financial Stability Board, n 13 above, 5. Ironically, the definition of the term is at best ambiguous. The Merriam-Webster dictionary defines “purports” as having “the *often specious* appearance of being, intending, or claiming” (emphasis added). See <https://www.merriam-webster.com/dictionary/purports#note-1>. As I will detail in the proceeding of the article, this linguistic ambiguity may be more telling than anticipated.

principal value of clients' claims while providing clients with liquidity,¹⁷ more specifically, the possibility to withdraw or redeem at will. The Global Financial Crisis (GFC) of 2007-2008 and the recent Covid-19 shock taught us that money market funds might collapse in times of crisis, triggering and boosting contagion.¹⁸ In the aftermath of the Global Financial Crisis, money market funds were subject to deep regulatory reforms on both sides of the Atlantic; hence, many of the previous shortcomings are now addressed.¹⁹

Holding the functional resemblance between MMFs and stablecoins, much is known about what can go wrong with this type of financial intermediation and how to regulate it. Unfortunately, these lessons seem to be forgotten when proposing new regulatory frameworks for stablecoins, opening up the way for future crises and contagion should liquidity dry up. In this article, I refer in particular to the "Market in Crypto-Assets" (MiCA) Regulation.²⁰ The final version of the Regulation has recently been approved with some relevant amendments compared to the original formulation. When referring to MiCA, this article will refer to its final, approved version unless stated otherwise. When referring to the EU Commission proposal of 2019,²¹ the article will indicate it as 'original proposal'. Before the approval of the final version, the European parliament put forward a proposal with several amendments.²² This article will refer to it as the 'amended proposal'.

The contribution of this article is, therefore, threefold:

- 1) First, from a positive perspective, it shows that stablecoins are a form of private money with a remarkable functional resemblance to money market

¹⁷ The concept of liquidity is complex and multifaceted. A wider discussion is provided in Section 2.1. For the time being, liquidity can be preliminarily defined as "the ability to sell any asset for other assets or cash at will". See K. Pistor, "A Legal Theory of Finance" (2013) 41 J Comp Econ 315, 316.

¹⁸ For instance, in September 2008, the US treasury approved a "Temporary Guarantee Program for Money Market Funds" to prevent further runs on the funds and avoid panics. See also W. Birdthistle, "Breaking Bucks in Money Market Funds" (2010) Wis L Rev 1155.

¹⁹ As shown by the theoretical model developed in R. Matta and E. Perotti, "Pay, Stay or Delay? How to Settle a Run" (2019) at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3487535 (last visited 30.08.2022).

²⁰ REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on Markets in Crypto-assets, and amending Directive (EU) 2019/1937, still to be published in the EU Official Journal.

²¹ 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 (hereinafter, 'original proposal').

²² "REPORT A9-0052/2022 on the proposal for a regulation of the European Parliament and of the Council on markets in crypto-assets and amending Directive (EU) 2019/1937" (March 17th, 2022) at https://www.europarl.europa.eu/doceo/document/A-9-2022-0052_EN.html (last visited 20.08.2022) (hereinafter "Amended Proposal").

funds. These entail similar liquidity risks and fragilities and should be regulated similarly, according to the “same business, same regulation” principle.

2) Second, the article shows that the scalability and sustainability of private money are largely a function of the applicable legal framework, both in terms of the design of private law entitlements and the applicable regulatory law.

3) Finally, from a normative perspective, the article takes a critical stance toward the European Union “Market in Crypto-Assets” Regulation (MiCA), highlighting the shortcomings of the regulation in terms of financial stability safeguards and liquidity risk.

The article unfolds as follows. Section 2 sets the analytical framework, defining the concepts of liquidity and safety for the creation of private money and the role of law in supporting private parties to offer liquidity and safety. To complete the analytical framework, the section introduces the discussion on divergent regulatory goals that can be pursued when approaching private money. Section 3 provides an in-depth discussion of the equivalence between money market funds and stablecoins. The analysis highlights the deep transformation in the goals pursued by the European regulator before and after the Global Financial Crisis. Section 4 explores the technological design of stablecoins and discusses the legal and economic implications of this design. Section 5 analyses the regulatory framework for stablecoins by MiCA, highlighting its shortfalls in terms of liquidity risk. Section 6 concludes.

2. Private money and liquidity risk: law and economics

“Private money” designates all forms of privately produced short-term debt that promise liquidity and safety. This section elaborates on these two key elements and their relationship and explains how both liquidity and safety must be legally constructed. This will provide a sound analytical framework to approach the construction and the regulation of stablecoins in the proceeding of the article.

2.1 Private money and liquidity risk

Liquidity represents one of the quintessential elements to lubricate any market economy. Yet, despite its crucial role, it remains an elusive concept. Understanding liquidity, liquidity risk, and the role of liquidity in boosting financial crises are crucial to designing a resilient regulatory framework for private money.

The concept of liquidity is complex, multifaceted, and dynamic in nature, as it applies to many different contexts and actors. Therefore, it is rarely used in “absolute” terms. In contrast, it is often used in combination with other terms defining the context of interest: credit liquidity, funding liquidity, stock liquidity,

and so forth. However, it is useful to provide a general definition that can then be applied to more specific instances.

Liquidity can be defined as the ability to sell any asset at will.²³ Crucially, liquidity is not always available on demand; it is not a free good.²⁴ Rather, liquidity is volatile and tends to be particularly scarce when it is most needed, i.e., in times of financial turmoil.

In other terms, the availability of liquidity is procyclical. In good times, when the economy is booming, liquidity is abundant and market players have incentives to engage in excessive liquidity transformation to maximise their profits. When the situation reverses, the risk generated by excessive liquidity transformation materialises and liquidity dries up.²⁵ This cyclical component was overlooked by financial economists up until the Global Financial Crisis of 2008. Crucially, the legal design of short-term claims supports the procyclicality of liquidity, and this is an aspect that is still often neglected.

To better grasp the concept of liquidity related to the issuers of short-term finance, including stablecoins, it is useful to distinguish between funding liquidity and asset liquidity.²⁶

Funding liquidity describes the ease with which investors can obtain funding.²⁷ Financial institutions traditionally rely on short-term debt, such as demand deposits, commercial papers, repos, and so forth. Therefore, when funding liquidity is low, financial institutions face different types of liquidity risks, depending on their funding model. For instance, looking at a case that will be discussed at length later in this article, money market funds face redemption risk as their shares are redeemable on demand.²⁸

Market liquidity, in contrast, describes the ease with which investors can raise money by selling assets. When market liquidity is low, selling assets depresses their price, so shrinking the balance sheet can become extremely costly.²⁹

²³ Pistor, n 17 above, 316.

²⁴ *ibid.*, 317.

²⁵ C. Borio, "The financial cycle and macroeconomics: What have we learnt?" (2014) 45 *J Bank Financ*, 182.

²⁶ Brunnermeier and Pedersen, n 15 above.

²⁷ M. Brunnermeier, "Deciphering the Liquidity and Credit Crunch 2007-2008" (2009) 23 *J Econ Perspect* 77, 91.

²⁸ For an early model of runs in equity instruments, see A. Shleifer and R. Vishny, "The Limits of Arbitrage" (1997) 52 *J Financ* 35.

²⁹ Brunnermeier, n 27 above, 92.

Crucially, the Global Financial Crisis showed that these two components reinforce one another in times of stress, spreading a shock in a specific sector, such as the mortgage market, to the whole financial sector.³⁰

The issue of liquidity shocks can be easily explained by looking at the typical financial intermediary, a bank. Traditionally, banks are highly leveraged and borrow money short-term via demand deposits or other money market instruments. This business model is inherently fragile and exposes banks to high funding liquidity risk. On the other hand, banks lend money long-term to finance illiquid projects.

Should illiquid assets decline in value, the amount of short-term funding the bank can raise against those assets would decrease. To keep leverage constant, or at least under control, the bank would be forced to sell some of its assets exactly when their price is low, depressing their value even further (market illiquidity).³¹ This, in turn, would tighten the lending standards of short-term investors, who will require higher margins to roll over their exposure or redeem their claims (funding illiquidity).³²

The combination and mutual reinforcement of these two mechanisms soon generate a run of short-term investors as these feel that late movers may not get the full amount of their claims.³³

What makes financial institutions fragile and, therefore, prone to runs is the mismatch between their assets and liability. Of primary interest here is the liquidity mismatch between assets and liabilities.³⁴

This brief introduction to liquidity risks highlights that promising liquidity is essential for modern economies and, at the same time, generates sizeable risks and makes the system inherently fragile.

Only legal and institutional mechanisms can support the promise of liquidity. Crucially, the design of legal entitlements and their interaction with regulatory law define the credibility of such promise and the risks associated with such promise.³⁵

³⁰ Brunnermeier and Pedersen, n 15. For empirical proof of the liquidity spiral for investment banks, see T. Adrian and H. S. Shin, "Liquidity and Leverage" (2010) 19 *J Financ Intermed* 418.

³¹ Brunnermeier, n 27 above, 92.

³² G. Gorton and A. Metrick, "Haircuts" (National Bureau of Economic Research, Working Paper 15273, 2009), at <http://www.nber.org/papers/w15273> (last visited 30.08.2022).

³³ Following the classical model in D. Diamond and P. Dybvig, "Bank Runs, Deposit Insurance, and Liquidity" (1983) 91 *J Polit Econ* 401. For an analysis of the most recent and "spectacular" physical bank run, see H. S. Shin, "Reflections on Northern Rock: The Bank Run That Heralded the Global Financial Crisis" (2009) 23 *J Econ Perspect* 101.

³⁴ This is called "Qualitative asset transformation". Banks borrow short-term, liquid, and safe liabilities and lend long-term, illiquid, and risky assets. See J. Armour et al., *Principles of Financial Regulation* (Oxford: Oxford University Press, 2016), 277.

³⁵ Awrey, n 8, 1.

2.2 Private money and the demand for safe assets

Safety is the second key characteristic of private money. Liquidity and safety are clearly interlinked; however, conceptually differentiating the two is useful as these refer to distinct economic rationales and are supported by different legal constructions.

An asset can be considered safe if it can be used to transact without concerns that the counterparty in the transaction has private information about its value.³⁶ Despite the seemingly simple definition, the nature and production of safe assets have been a constant and crucial issue that society has solved in different and increasingly sophisticated ways over time.

Producing safe assets is valuable to society; however, safe assets are scarce. In this light, the creation of private money can also be seen as a response to a shortage of publicly produced safe assets, such as government debt.³⁷

To understand why and how the demand for (privately produced) safe assets shapes the liquidity risk of private money, it is important to introduce the main characteristics of financial safe assets. First, safe assets must be liquid, meaning that they can be liquidated at any time at face value. However, liquidity is a necessary but insufficient condition to create safety. Safe assets must also enjoy a related but separate characteristic: being money-like. This means that the assets, to be considered entirely “safe”, must be accepted by all parties, at all times, at their face value. In other words, these must comply with the “no questions asked” (NQA) principle.³⁸

To achieve these goals, safe assets must be designed to be “information insensitive”, meaning that private parties should have no incentives to produce private information on the safety of these assets because nobody fears adverse selection. Therefore, producing “safe assets” is a business where the price system cannot – and is not supposed – to work.³⁹ Only in this way can the NQA principle and the smooth circulation of these assets be guaranteed. In a sense, safe assets are the lubricant of any advanced financial system.

This construct brings about two main consequences. First, safe assets have a “convenience yield”, meaning that holding safe assets in the portfolio brings about

³⁶ G. Gorton, “The History and Economics of Safe Assets” (2017) 9 *Annu Rev Econ* 547, 548.

³⁷ R. Caballero, E. Farhi and P. Gourinchas, “The safe assets shortage conundrum” (2017) 31(3) *J Econ Perspect* 29, 37.

³⁸ B. Holmstrom, “Understanding the role of debt in the financial system”, (BIS Working Papers No 479, 15) at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2552018 (last visited 30.08.2022).

³⁹ G. Gorton and G. Ordóñez, “The supply and demand for safe assets” (2022) 125 *J Monetary Econ* 132.

a value beyond the return such assets guarantee.⁴⁰ Second, if the privately produced safe assets lose their information insensitivity and investors start producing private information, the rational reaction is to adjust on quantity, i.e., to run.⁴¹

Collateralised short-term debt can – to an extent – replicate the characteristics of publicly produced safe assets. Recent studies show that debt instruments backed by other debt represent the construction that is more apt to guarantee a higher level of information insensitivity.⁴²

Similar to liquidity, the safety of financial assets must be supported by the legal system. Again, the law and the applicable regulatory framework determine how credible the promise of safety from private parties is.

2.3 Legal underpinnings of private money

Liquidity and safety are the key characteristics of private money. Both are crucial to creating value for society, ensuring that the financial system works smoothly. At the same time, both generate sizable risks for society, making the financial system inherently fragile.

Private parties cannot credibly promise safety and liquidity, i.e., issue private money, unless such promise is somehow backed by the law. Thus, the legal and regulatory regime supporting private money is crucial for generating societal value but can also boost the fragility of the system.

This section explains the key legal tools to support the creation of private money, the risks these generate, and the common regulatory strategies to handle these risks.

Starting with liquidity, this article showed how it could be privately realised through the issuance of short-term financial claims. From a legal perspective, short-term debt and the ability to issue it is, by and large, a function of the possibility to grant and enforce legal entitlements to the holder of the short-term claim. In modern societies, only the law can support the promise of selling (liquid) assets at will.⁴³

⁴⁰ This implies that investors have a preference for holding safe assets that goes beyond what the standard portfolio diversification models would suggest. It also implies that investors are willing to pay for safety and the yield of safe assets is lower than the traditional asset pricing model would suggest. This “convenience yield” was first measured in A. Krishnamurthy and A. Vissing-Jorgensen, “The aggregate demand for treasury debt” (2012) 120(2) *J Polit Econ*, 233 [US Treasuries over 1926–2008 to be, on average, 73 basis points lower than it otherwise would have been due to the moneyness and safety of US Treasuries; this is the convenience yield]. See also, A. Krishnamurthy and A. Vissing-Jorgensen, “The impact of treasury supply on financial sector lending and stability” (2015) 118(3) *J Financ Econ*, 571.

⁴¹ Gorton, n 36 above, 549

⁴² T. Dang, G. Gorton, and B. Holmström, “The information view of financial crises” (2020) 12 *Annu Rev Financ Econ*, 39.

⁴³ Pistor, n 17 above.

The type and design of legal entitlements vary considerably across different forms of private money. The common denominator to all the different legal constructions is the reliance on the principle of freedom of contract in combination – when necessary – with proprietary rights over assets (collateral) to support the credibility of the promise. These contractual and proprietary rights must be strong enough to generate in the holder of the short-term claim the confidence that such a claim is liquid. From a legal perspective, this means that the claim can be transferred or realised at will.

This already allows highlighting how the procyclical nature of liquidity is grounded on the design of the legal entitlements supporting short-term liquid debt. Debt and debt-like instruments are fixed claims vis-à-vis the issuer. The short-term nature of these claims allows the holder to realise its value virtually at any time, also when liquidity dries up. Even more so, if the short-term claim is supported by proprietary rights on collateral, the holder can additionally realise the collateral.

These entitlements are not only strong but also rigid: their design does not allow for ex-post adjustments in the terms of the agreement in consideration of a stressed macro-economic or macro-financial scenario.

The strength and rigidity of these entitlements legally support the promise of liquidity. This is a feature of legal entitlements and is necessary to support the credibility of short-term debt.⁴⁴ On the other hand, these foster the procyclicality of liquidity risk since debt claims supported by strong legal entitlements are over-issued in times of economic booms and can be realised, i.e., run upon, in bad times, contributing to market and funding illiquidity.

Consequently, so long as liquidity is abundant, the strong legal entitlements granted to the holders of short-term debt facilitate the issuance of private money. However, when liquidity dries up, the strong legal entitlements trigger the liquidity spirals between market and funding illiquidity, boosting a crisis that damages society.

This latter remark highlights a fundamental trade-off between investor protection through strong legal entitlements and financial stability. This goes against the original hypothesis developed by the “Law and Finance” literature according to which investor protection directly and strongly correlates with social welfare.⁴⁵ In

⁴⁴ In the aftermath of the Global Financial Crisis, both legal and economic scholarship engaged in a lively debate about countercyclical law and regulation. For a broad account of such literature, see J. Masur and E. Posner, “Should regulation be countercyclical” (2017) 34 *Yale J. on Reg.*, 857 and Y. Listokin, “Law and macroeconomics: The law and economics of recessions” (2017) 34 *Yale J. on Reg.* 791.

⁴⁵ By “Law and Finance” literature here I mean the original articles published by La Porta et al. since the late 90s. R. La Porta et al., “Law and finance” (1998) 106(6) *J Polit Econ*, 1113. Since then, the law and finance movement has evolved enormously, acknowledging the merits but also the many

the context of short-term debt issued by financial institutions, strong legal protection of the investors in such debt is, over the cycle, harmful to society – more specifically, it allows externalising systemic risk.

The liquidity risk inherent in short-term debt is tightly related to the second key characteristic of private money – safety. Again, the design of the legal entitlements attached to short-term debt is crucial for allowing private parties to credibly promise safety.

Credibly promising safety is even more complex than credibly promising liquidity. For the latter, the legal framework must provide the possibility to freely design enforceable contracts and allocate property rights encumbering assets. These two features are necessary yet insufficient to fulfil the “no questions asked” principle, hence promising safety.

These two powerful tools – contracts and property – fail to solve the liquidity and NQA problem in bankruptcy, where obligations cannot be immediately released as they are subject to mandatory stay.⁴⁶ In the framework sketched so far, having collateral subject to mandatory stay would make – by design – a claim illiquid and would increase the incentives of parties to produce private information on the quality of the collateral and of its issuer.

Therefore, the private creation of safe assets also requires bankruptcy privileges whereby obligations supported by financial collaterals (i.e., debt backing debt) can escape mandatory stay. Nowadays, these are widespread in advanced economies and are called “bankruptcy safe harbours”.⁴⁷ The possibility to “adjust on quantity” (run) until the very last minute, even after bankruptcy has been declared, delays the incentives to generate any sort of private information to the largest extent possible.

In the European context, the EU legislator introduced the bankruptcy safe harbours in 2002 with the “Financial Collateral Directive”.⁴⁸ When introducing the bankruptcy safe harbours, the European Legislator explicitly mentioned the goal of fostering the use of financial collateral by increasing legal certainty and

limitations of the investor protection argument. See, among many, A. Paces, “Why Investor Protection Is Not All That Matters In Corporate Law and Economics” (2009) 6(2) *The Icfai University Journal of Corporate and Securities Law*, 8; Pistor, n. 17 above, 325.

⁴⁶ Mandatory stay refers to those provisions that ensure that creditors cannot collect debts from a debtor who has declared bankruptcy. For a comparative overview, see S. Claessens and L. Klapper, “Bankruptcy around the world: Explanations of its relative use” (2005) 7(1) *Am Law Econ Rev*, 253.

⁴⁷ On the relevance of bankruptcy safe harbours for the financial system, see P. Paech, “The value of financial market insolvency safe harbours” (2016) 36(4) *Oxford J Legal Stud*, 855.

⁴⁸ DIRECTIVE 2002/47/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 6 June 2002 on financial collateral arrangements.

harmonisation.⁴⁹ This is supposed to boost liquidity in the market when liquidity is already abundant. However, this approach failed to factor in the effects of these provisions when liquidity dries up.⁵⁰

Such a strong and rigid legal support for the private creation of safe assets matched – and still matches – the societal demand and the shortfall in publicly produced safe assets. However, it also increases systemic risk along two dimensions: first, increasing liquidity risk as the volume of short-term liquid debt that is produced increases considerably; second, delaying the production of early warnings of an upcoming crisis.

This brief analysis of the legal underpinnings supporting the creation of private money is relevant for the purpose of this article for three reasons. First, it highlights how the demand for the creation of (safe) private money, including stablecoins, is endogenous to the functioning of modern financial systems and the legal framework adapted over time to provide an answer to such demand.⁵¹ Second, it shows how strong and rigid legal entitlements support the creation of private money and, at the same time, are procyclical and bolster liquidity risk. In the context of stablecoins, this is particularly relevant as the design of the distributed ledger technology and of the various verification protocols is thought to provide strong and rigid entitlements to the holders of crypto-assets, with little to no possibility of adjustment. Third, this represents the baseline for all the different types of regulation aiming at preserving financial stability interfering with these private law arrangements, either by restricting the possibility of entering into such arrangements only to licensed entities, by imposing substantive requirements on these arrangements to guarantee their resilience and so forth. The next section will delve into the possible regulatory frameworks applicable to private money, looking at the different and competing policy goals pursued by the regulator.

2.4 Regulation of private money and competing policy goals

Liquidity risk arises endogenously when dealing with short-term, money-like debt. Private law and regulatory law shape the possibility to promise safety and liquidity, i.e., the possibility of credibly issuing private money.

⁴⁹ “In order to improve the legal certainty of financial collateral arrangements, Member States should ensure that certain provisions of insolvency law do not apply to such arrangements, in particular, those that would inhibit the effective realisation of financial collateral”, DIRECTIVE 2002/47/EC, Recital 5.

⁵⁰ In the words of Pistor, it considered liquidity as a “free good”.

⁵¹ This mechanism parallels the “financial instability hypothesis” formulated by Minsky, whereby financial crises are endogenously generated by the internal dynamics of the system. H. Minsky, “The financial instability hypothesis: An interpretation of Keynes and an alternative to “standard” theory” (1977) 16(1) *Nebraska Journal of Economics and Business*, 5.

Specifically, regulatory law interacts with private law by foreclosing the possibility of entering into certain private law arrangements or setting up additional safeguards that support the promise of safety and liquidity.

The regulation of banking institutions offers the most classic and paradigmatic example. No entity can issue demand deposits while granting credit unless it has a banking licence. Acquiring a licence allows chartered banks to offer safety and liquidity while engaging in qualitative asset transformation. However, acquiring and maintaining a licence also implies that banks must comply at all times with a vast array of requirements.⁵² In return, licensed banks can access the liquidity facilities of the central banks and be backed by deposit insurance. In addition, the barrier to entry allows banks to extract rent “in exchange” for the tighter regulatory framework.⁵³

This is one example of how the full support of regulatory law can interact with private law to turn “bad” private money into “good” private money.⁵⁴ However, this comes at a cost. On the one hand, licensed banks extract rent from consumers in the form of fees higher than what would be applied in a competitive market.⁵⁵ On the other hand, and most importantly, the public backstop generates moral hazard incentives so that the cost of excessive risk-taking is externalised.

This represents a generic description of the current consensus on banking regulation. However, this can vary considerably across jurisdictions and time. To provide a recent and relatable example, until 15 years ago, deposit insurance in the U.K. was extremely limited: deposits were fully insured only up to 2,000 pounds, and then only 90 per cent of the deposits up to an upper limit of 35,000 pounds.⁵⁶

Furthermore, the transformation of liquid and safe liabilities into illiquid and risky assets is not solely performed by licensed banks but also by a plethora of non-bank institutions engaged in functionally similar activities.⁵⁷

One could continue indefinitely with examples of this sort, but these seem sufficient to show that the ability and willingness of the law to curtail liquidity risk depends

⁵² On the potential problem of over-regulation and migration to the unregulated sector, see J. Dagher et al., “Benefits and costs of bank capital” (International Monetary Fund Staff Discussion Note SND/16/04), 30 at <https://www.imf.org/en/Publications/Staff-Discussion-Notes/Issues/2016/12/31/Benefits-and-Costs-of-Bank-Capital-43710> (last visited 30.08.2022).

⁵³ And enjoy the rent generated by the barrier to entry, see Gorton, n 36 above, 570.

⁵⁴ On the role of public policy to turn “bad” into “good” private money, see Awrey, n 8 above, 25.

⁵⁵ G. Gorton, n.36 above, 570.

⁵⁶ Shin, n 33 above, 101.

⁵⁷ For a more extensive account of the phenomenon, see H. Nabilou and A. Paccès, “The law and economics of shadow banking”, in I. Chiu and I. MacNeil (eds.) *Research Handbook on Shadow Banking* (Cheltenham: Edward Elgar Publishing, 2018).

on the goals pursued by the regulator, and these can vary over time depending on societal preferences.

This premise is necessary to point out as the law and regulatory preference will also shape the ability of stablecoins to credibly commit to issuing private money as well as the liquidity risk stemming therein. It is, therefore, crucial to map the implications of divergent regulatory goals in terms of liquidity risk.

Financial regulation traditionally pursues three main goals: financial stability, investor protection, and market efficiency.⁵⁸ While the relevant facets of financial stability have been widely discussed, it is important to define investor protection and market efficiency for the purpose of this article.

Investor protection is defined broadly. Typically, the “investor protection” label designates a set of regulatory laws that aim to protect investors’ entitlements in financial markets, such as the conduct of business rules and the like.⁵⁹ Beyond this, the underlying mechanisms devised by private and regulatory law to create strong, rigid, and enforceable entitlements also aim to protect investors.⁶⁰

As regards market efficiency, the previous discussion showed that it should not be a primary concern when discussing private money since the price system is – by design – not supposed to work because of information insensitivity.⁶¹ What remains, mainly preventing market abuse and insider trading, largely correlates with investor protection both in terms of theoretical construct and regulatory tools. Thus, in the remainder of the article, market efficiency and investor protection will be considered together.

Balancing investor protection and financial stability in regulating private money is already a complex exercise. However, the puzzle is further complicated by an underlying objective in law-making, which is the willingness of legislators to attract investments and economic activities in their jurisdiction by offering an attractive, flexible, and investor-friendly legal environment.⁶²

⁵⁸ Armour et al, n 34, 61. They enucleate six goals: investor protection, consumer protection, financial stability, market efficiency/integrity, promoting competition, and preventing financial crime. In this article, investor protection and consumer protection can be grouped together. The same goes for the promotion of competition since increasing competition is supposed to increase consumer/investor welfare. The prevention of financial crime can be considered as a constant, underlying objective that does not influence the analysis.

⁵⁹ For a broad introduction to the European framework, see M. Wallinga, *EU Investor Protection Regulation and Liability for Investment Losses* (Berlin: Springer, 2020).

⁶⁰ At least in the definition provided by the LLSV literature where investor protection correlated with market development.

⁶¹ Text to note 40. See also, Gorton, n 39.

⁶² The typical example in this regard is Delaware corporate law. See L. Bebchuk and A. Cohen, “Firms’ decisions where to incorporate” (2003) 46(2) *J Law and Econ*, 383. The evidence on the

The recent regulatory efforts in the “digital revolution” area are not immune from it.⁶³ The European legislator, in presenting the “Digital Services Act” package, explicitly referred to the importance of being a front runner “to foster innovation, growth, and competitiveness, both in the European Single Market and globally”.⁶⁴ Accordingly, the “Market in Crypto-Assets” Regulation explicitly includes “support to innovation” among its goals.

Achieving these three overarching objectives requires the use of specific regulatory tools. However, the tools necessary to protect investors may differ from the ones needed to preserve financial stability. The same argument goes for tools “supporting innovation” and tools preventing financial stability.

To substantiate this claim, one should consider that (good) regulation preserving financial stability must be preventive and countercyclical in nature.⁶⁵ Regulation should impose relatively strict requirements to curtail risk-taking in good times and build up enough capacity to withstand shocks when they materialise. Moreover, effective tools to preserve financial stability are flexible enough to adjust over the cycle because of their design (e.g., capital buffers in banks)⁶⁶ or because of the powers entrusted to the supervisory authority (e.g., stress-testing or resolution planning for banks).

In contrast, both investor protection and innovation support are largely procyclical insofar as achieving both goals entails the allocation of strong, rigid entitlements that can be enforced at all times to guarantee legal certainty and complete predictability, hence incentivising investments.

Much of the historical developments of financial regulation can be read as an attempt to find a suitable equilibrium among these competing and divergent policy

effects of regulatory competition is mixed and context-dependent. On the fear of regulatory competition in Europe, see S. Deakin, “Legal diversity and regulatory competition: which model for Europe?” (2006) 12(4) *Eur Law J*, 440 and L. Enriques, “EC company law and the fears of a European Delaware” (2004) 15 *Eur. Bus. L. Rev.*, 1259.

⁶³ For an application to Artificial Intelligence, see N. Smuha, “From a ‘race to AI’ to a ‘race to AI regulation’: regulatory competition for artificial intelligence” (2021) 13(1) *Law, Innovation and Technology*, 57.

⁶⁴ European Commission, The Digital Services Act package, accessible at <https://digital-strategy.ec.europa.eu/en/policies/digital-services-act-package>

⁶⁵ C. Borio, “Implementing the macroprudential approach to financial regulation and supervision” in C. Green, E. Pentecost, and T. Weyman-Jone (eds) *The financial crisis and the regulation of finance* (Cheltenham: Edward Elgar Publishing, 2011). On the disastrous effects of procyclical financial regulation, see R. Repullo and J. Suarez, “The procyclical effects of bank capital regulation” (2013) 26(2) *Rev Financ Stud*, 452. See also M. Behn, R. Haselmann, and P. Wachtel, “Procyclical capital regulation and lending” (2016) 71(2) *J Financ*, 919.

⁶⁶ M. Drehmann, C. Borio and K. Tsatsaronis, “Anchoring countercyclical capital buffers: the role of credit aggregates” (2011) 7(4) *Int J Cent Bank*, 189.

goals, with the main focus moving around these goals depending on social and political preferences as well as the level of economic understanding.

A few brief examples will prove helpful. Preserving financial stability is, by and large, the main goal in regulating commercial banks. However, even within the various requirements for commercial banks, the divergent regulatory goals of financial regulation play a key role. For instance, licensing a bank creates a barrier to entry and limits competition. On the one hand, this has proven the best approach to safeguard financial stability.⁶⁷ However, on the other hand, this goes to the detriment of depositors (i.e., investors) who are paid a return lower than what is available in a competitive environment.⁶⁸

Again, many parts of bank regulation have a more direct financial stability orientation, with investor protection as a secondary goal, for instance, capital and liquidity regulation. Both require banks to build up enough capacity to withstand future shocks, protecting society from systemic externality and the cost of a potential bail-out, and investors in unsecured and uninsured instruments. However, stringent capital and liquidity regulation quickly raise arguments of “over-regulation” of the banking industry and have the unintended consequence of stimulating the migration of capital towards the unregulated sector.⁶⁹

These two examples clearly show how difficult it is to strike a balance between competing goals. The balance depends on the choice made by the policymaker and varies over time. For instance, bank capital rules were considerably loosened in the period leading up to the Global Financial Crisis, allowing a massive use of internal models to assess the riskiness of bank assets. History proved such a policy choice heavily misguided. However, one of its key rationales was incentivising banks to innovate their risk assessment models, thereby rewarding banks with superior risk assessment systems.

In contrast, the repo market is a typical example where the key focus is to protect investors and foster innovation in the financial sector, to the possible detriment of financial stability. Short-term overcollateralised transactions assisted by bankruptcy safe harbours represent a form of strong investor protection and support

⁶⁷ S. Schich and S. Lindh, “Implicit guarantees for bank debt: Where do we stand?” (2012) *OECD Journal: Financial Market Trends*, 45. Offering privileges to firms to attract funds as a form of jurisdictional competition is not exclusive to banks. In the broader corporate context, see H. Butler, “Nineteenth-century jurisdictional competition in the granting of corporate privileges” (1985) 14(1) *J Legal Stud*, 129.

⁶⁸ F. Diebold and S. Sharpe, “Post-deregulation bank-deposit-rate pricing: The multivariate dynamics” (1990) 8(3) *J Bus Econ Stat*, 281.

⁶⁹ For a model of migration to the unregulated sector because of stringent capital requirements, see J. Begenau, “Capital requirements, risk choice, and liquidity provision in a business-cycle model” (2020) 136(2) *J Financ Econ*, 355.

the willingness of banks and non-banks to engage in innovative – and often risky – financial instruments. The strong opposition to any type of regulation for repo transactions even after the crisis, such as minimum haircut requirements, represents a clear choice in the regulatory goals pursued.

Finally, regulatory sandboxes, whereby the regulator allows innovative firms to test their product in a controlled environment, are an example of a regulatory tool that aims to foster and support innovation while safeguarding financial stability. This allows the regulator itself to learn about potential, unforeseen risks and – at the same time – allows testing the innovative technology derogating from some legal obligations.

The remainder of the article applies this multi-layer analytical framework to assess the regulatory regime for stablecoins designed by the European Union. To that end, the article first looks at the regulatory trajectory of a specific form of private money: the shares of money market funds. After that, the article introduces stablecoins and establishes a functional similarity between stablecoins and money market funds.

3. The regulation of Money Market Funds (MMFs): a success story

It is time to analyse the nature, risks, and regulation of money market funds in greater detail. This type of investment entity surged to media attention at the inception of the Global Financial Crisis of 2008. The day after Lehman filed for bankruptcy, on September 15th, 2008, the Reserve Primary Fund “broke the buck” and generated a widespread commotion among market participants, leading to mass redemption.

As already noted by the several references made in previous sections, the trajectory of money market funds and their regulatory regime is particularly informative for understanding the risk inherent in stablecoins and their regulation, especially considering the discussion on the competing regulatory goals and how these shape liquidity risk.

The run on money market funds best exemplifies the risks embedded in allowing non-banks to guarantee the safety and liquidity of their liabilities while investing in relatively illiquid and risky assets.⁷⁰

However, looking at the collapse of money market funds is not the most informative thing to do. Rather, it is important to understand how money market funds surged and became a key player in providing liquidity to the modern financial system (3.1).

⁷⁰ For the paradigmatic example of the repo market, see G. Gorton and A. Metrick, "Securitized Banking and the Run on Repo" (2012) 104 J Financ Econ, 425.

Then, it is important to see how the goals pursued by the regulators have changed to fix the several shortcomings of the regulatory regime previously applicable to money market funds (3.2).

3.1 A history of regulatory arbitrage

Money market funds are a class of mutual funds performing the economic function of a bank account. Investors are – formally – shareholders, as MMFs issue shares that are redeemable at any time, at par. The fund, in turn, invests the proceeds primarily into money market instruments, aiming to assure investors a return higher than common bank deposits. Profits are distributed as additional shares to investors to maintain the value stable. This makes the business model of MMFs particularly palatable for wealth management.⁷¹

Crucially, the MMF is going to be more fragile the less liquid the money market instruments on the asset side of its balance sheet. For instance, in the period leading up to the GFC, the riskier MMFs had a considerable amount of Mortgage-Backed Securities in their portfolio. Those were considered safe and liquid while guaranteeing higher returns. Needless to say, when market liquidity dried up following the burst of the housing bubble, investors started to fear the credibility of the MMFs' promise to redeem and started to run.⁷²

There are two reasons why the promise of redeeming at par at any time has been credible for decades. First, regulation allowed calculating the Net Asset Value per share, rounding it to the closest percentage point.⁷³ This allowed MMFs to withstand limited fluctuation in value.⁷⁴ Second, MMFs were usually backed by sponsoring banks who pledged to bail out investors should the MMFs “break the buck”. This had the effect of stabilising MMFs, decreasing the incentives of investors to run. However, it also has the effect of spreading contagion if the sponsoring bank has to step in and bail out its sponsored MMF in times of turmoil.

As detailed in the previous example, the key issue is that liquidity mismatch tends to increase during credit booms, where the expectation of assets liquidity is high. This makes MMFs even more delicate as a business: when the financial cycle

⁷¹ Interestingly, many FinTechs offering investment accounts “deposit” clients’ money into money market funds, as they are not allowed to hold their clients’ money on their own account. See, for instance, “DeGiro”, the largest online execution-only broker, at <https://www.degiro.co.uk/about-degiro/cashfunds> (last visited 30.08.2022).

⁷² For empirical validation, see L. Schmidt, A. Timmermann and R. Wermers, "Runs on Money Market Mutual Funds" (2016) 106 Am Econ Rev, 2625.

⁷³ So-called “penny round convention”. See SEC 17 C.F.R. § 270.2a-7. A reform of the rule entered definitely into force in 2016.

⁷⁴ So long as NAV per share is at 0.995 or above, redemption at par is legally possible.

reverses and liquidity dries up, they are at the apex of their fragility and well positioned to spread contagion.⁷⁵

From a legal perspective, this logically follows the regulatory regime applicable to this type of institution. In fact, consistently with the regulatory arbitrage origin, money market funds could be established as “normal” mutual funds. In Europe, this meant that to run the business of a money market fund, an entity should be licensed as an “undertaking for the collective investment in transferable securities” (UCITS)⁷⁶ or an “alternative investment fund” (AIF).⁷⁷ Crucially, both the UCITS and AIF regimes prioritise investor protection and market integrity as regulatory goals. This is in line with the nature of a typical investment fund; however, it has proven to be utterly unfit for money market funds.

The following subsection details how post-crisis regulation recalibrated its regulatory goals, focusing on financial stability rather than investor protection. In doing so, the new regime effectively addresses the fragilities in terms of liquidity transformation, “net asset value per share” calculation, and contagion effects.

3.2 The post-crisis reforms in the EU

Policymakers on both sides of the Atlantic quickly realised that money market funds were too fragile to keep regulating them simply as mutual funds. This section focuses on the European Regulation on Money Market Funds⁷⁸ and provides a comparison with the MiCA Regulation. However, a similar discussion could run for the current regulatory framework of MMFs in the United States.⁷⁹

The European regulation defines money market funds as entities organised as collective investment undertakings, investing in short-term assets, and with the objective of “offering returns in line with money market rates or preserving the value of the investment”.⁸⁰ Therefore, any MMF should have a double authorisation – first, as an investment fund and second, as a money market fund.⁸¹

⁷⁵ On procyclicality and the need for macroprudential policies, see Borio, n 25 above.

⁷⁶ Directive 2009/65/EC of the European Parliament and of the Council of 13 July 2009 on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS).

⁷⁷ Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010.

⁷⁸ Regulation (EU) 2017/1131 of the European Parliament and of the Council of 14 June 2017 on money market funds (hereinafter “MMF Regulation”).

⁷⁹ For a comparative analysis between the US and the EU regime, see V. Baklanova and J. Tanega, *Money Market Funds in the EU and the US* (Oxford: Oxford University Press, 2014).

⁸⁰ Article 1 MMF Regulation.

⁸¹ The procedure to require MMF authorisation differs for UCITS and AIFs. See, respectively, Article 4 and Article 5 of the MMF Regulation.

Crucially, the authorisation to act as an MMF shall also indicate the type of operations the fund will carry out. Accordingly, the regulation provides for three possible types of short-term money market funds:

- 1) Variable Net Asset Value (VNAV);
- 2) Low Volatility Net Asset Value (LVNAV);
- 3) Constant Net Asset Value (CNAV).

This represents a key innovation in the regulatory framework and will prove crucial also in the comparison with the MiCA regime for crypto-assets. One can immediately notice that only a subset of MMFs can still guarantee the constant value of their shares or units. Intuitively, such a subset is subject to tighter regulation in terms of liquidity management.

Before looking at the specific regime applicable to each type of mutual funds, it is informative to start from the set of rules which apply to all funds in terms of asset eligibility and credit quality assessment.

First, the regulation sets a series of limits on the types and characteristics of financial assets that any MMF can invest in, such as money market instruments, Asset-Backed Commercial Paper (ABCP), and so forth.⁸² While it is not necessary to delve into the details of these rules, it suffices to notice that MMFs are statutorily prevented from investing in assets that are too illiquid both because of their risk or maturity profile or because of the type of issuer of such financial assets.⁸³

To complement the provisions on asset eligibility, the regulation mandates the fund manager to “establish, implement, and consistently apply” a prudent procedure to internally assess the credit quality of the assets owned by the fund. To complement the internal assessment, each fund should run stress tests to identify possible weaknesses in a stressed scenario and duly inform ESMA about the results of such tests.⁸⁴

Together with the UCITS or AIFM directives, these are the ground rules applicable to any MMF. Beyond this baseline, the regulation provides for a differentiated set of rules for the different types of money market funds. Such a differentiated regime is rooted in the fact that each type of MMFs is allowed to calculate the “NAV per share”, i.e., the redemption price, differently.⁸⁵ As discussed in Section 2.2, specific

⁸² See Articles 9-16 MMF Regulation.

⁸³ For the rules on diversification and concentration, see Articles 17 and 18 MMF Regulation. For instance, VNAV MMF can invest up to 10% of its assets in money market instruments issued by a single counterparty. This percentage decreases to 5% for CNAV and LVNAV MMFs. The regulation provides specific rules also for other eligible asset classes.

⁸⁴ Article 28 MMF Regulation.

⁸⁵ Article 33 MMF Regulation.

ways of calculating NAV generate fragility and incentivise runs during turmoil. Therefore, the regulation mandates different safeguards depending on how the NAV per share is calculated. In addition, different ways to calculate the NAV entail different rules on portfolio management and different rules on early “crisis aversion” mechanisms.

The (relatively) laxer regime is applied to VNAV funds. It is instructive to begin with this regime to appreciate the rationale for the more stringent regulation of LVNAV and CNAV funds.

As the name itself reveals, “Variable Net Asset Value” (VNAV) funds have only the objective of providing redemption at par but cannot promise it. The regulation mandates VNAV MMFs to calculate their net asset value and publish such value daily. The “NAV per share” shall be determined by the difference between the value of assets⁸⁶ and liabilities divided by the number of outstanding shares.⁸⁷ Crucially, the NAV per share shall be rounded to the nearest basis point, not the percentage point.⁸⁸ Therefore, it is not possible to guarantee redemption at par so long as the MMF does not “break the buck”. Nonetheless, the business model of VNAV MMFs is also prone to runs, given their short-term, money-like nature.

Imagine the case where a VNAV MMF invests a considerable part of its assets in eligible ABCP issued by an investment vehicle active in the US real estate market. What would happen if the rumour of a housing bubble in the US market starts spreading? It is reasonable to imagine that the mark-to-market valuation model for the ABCP would incorporate this adverse information so that the NAV per share would decrease slightly. In turn, this may trigger the holders of shares (or units) of the MMF to redeem the value of their claim in anticipation of further losses. To face such abnormal withdrawals, the MMF would be forced to sell some of its most liquid assets, say, public debt. In turn, this would make the fund’s overall portfolio even more illiquid, triggering further withdrawals and so forth.

This simple example justifies the fact that, despite not guaranteeing redemption at par, the regulatory regime for a VNAV fund is much stricter than a common investment fund. Such a tighter regime materialises in specific portfolio rules to guarantee effective liquidity management and minimise the risk of runs due to funding and asset illiquidity. Therefore, the “Weighted Average Maturity” of a VNAV MMF portfolio should be no more than 6 months, and the “Weighted

⁸⁶ Calculated according to the mark-to-market or mark-to-model methodology, pursuant to Article 29 MMF Regulation.

⁸⁷ Article 30(1) MMF Regulation.

⁸⁸ Article 30(2) MMF Regulation.

Average Life” should not exceed 12 months. Moreover, 15% of the portfolio should be invested in weekly maturing assets, half of which should mature daily.⁸⁹

In contrast, the rules for calculating the “NAV per share” and the “redemption price” for LVNAV and CNAV MMFs are much different, which informs the different regulatory regimes. CNAV MMFs are on the other side of the spectrum compared to VNAV MMFs. The “NAV per share” can still be rounded to the nearest percentage point.⁹⁰ Therefore, the shares of a CNAV fund can be issued and redeemed at par so long as the fund does not break the buck.⁹¹

To make this construction feasible and resilient, the rules on asset eligibility and portfolio management are much stricter than the ones previously discussed. CNAV MMFs shall invest 99.5% of their portfolio in money market instruments issued or guaranteed by public bodies, in reverse repos secured by government debt or in cash.⁹² This allows using an amortised cost method to value the CNAV MMFs’ assets.⁹³ As a result, the “NAV per share” is more easily kept constant compared to the alternative mark-to-market or mark-to-model approaches. Crucially, the difference between the “NAV per share” rounded to the nearest basis point and the nearest percentage point shall be published daily, providing daily updates on the risk of the MMF to “break the buck”.⁹⁴

Moreover, CNAV MMFs should abide by further portfolio rules. Namely, the “Weighted Average Maturity” of the portfolio should be no more than 60 days, in contrast with the 6 months for the VNAV MMFs, and the “Weighted Average Life” should not exceed 120 days, in contrast with the 12 months for the VNAV MMFs.⁹⁵ Moreover, 30% of the portfolio should be invested in weekly maturing assets, half of which should mature daily.⁹⁶

Low Volatility (LV)NAV MMFs lie between variable and constant NAV MMFs, both conceptually and regulatorily. The method to calculate the “NAV per share”

⁸⁹ Article 25 (1) MMF Regulation. According to paragraph 2 of the same article, should these limits be exceeded for reasons beyond the control of the MMF or as a result of the exercise of redemption rights, the MMF shall adopt as a priority objective the correction of that situation. Moreover, Article 41(1)(b) grants the Competent Authority the power to take appropriate and proportionate actions should the MMF fail to comply with the portfolio rules of Article 24.

⁹⁰ Article 31(2) MMF Regulation.

⁹¹ Article 33(2)(a) MMF Regulation. This means that so long as the NAV per share is equal to or higher than 0,995 €, the MMF can issue and redeem shares at 1 €, thanks to the “percentage round”. However, if the “NAV per share” falls below 0,995 €, the MMF can only issue and redeem at a constant value of 0,99 € per share.

⁹² Article 2(1)(11) and Article 17(7) MMF Regulation.

⁹³ Article 29(6) MMF Regulation.

⁹⁴ Article 30(4) MMF Regulation.

⁹⁵ Article 24(1)(a) and (b) MMF Regulation.

⁹⁶ Article 24(1)(c) and (e) MMF Regulation.

is the same as the one for CNAV MMFs, rounded to the nearest percentage point.⁹⁷ Likewise, the rules on portfolio maturity and weekly and daily maturing assets are the same ones applicable to CNAV funds. However, LVNAV funds are not bound by the requirement of investing 99,5% of their portfolio in public debt. Therefore, their ability to redeem shares at a constant NAV is constrained, as the constant NAV should not deviate more than 20 basis points from the actual “NAV per share” calculated according to mark-to-market and mark-to-model approaches.⁹⁸

To complement the rules on portfolio restriction and NAV calculation, the regulation put forward also mechanism to avert runs for the two most fragile constructions, i.e., CNAV and LVNAV MMFs.⁹⁹ Specifically, when the portfolio rules for CNAV and LVNAV on the amount of daily and weekly maturing assets are breached, the board of the MMF shall “determine the appropriate course of action having regard to the interests of the investors.” Specifically, the board can deliberate one of the following measures:

- 1) impose liquidity fees to let investors internalise the liquidity externalities that they would generate on other, non-running investors;¹⁰⁰
- 2) impose redemption gates, limiting the amount of redeemable to 10% of the total per day, de facto limiting the possibility to run;¹⁰¹
- 3) suspend the possibility of redeeming shares for a period of up to 15 days.¹⁰²

At this point, the board can also decide not to take any of these actions. However, if the breach of the portfolio rules become serious, the board must decide whether to impose liquidity fees or suspend redemption.¹⁰³ The decision shall be promptly reported to the competent authority.¹⁰⁴

⁹⁷ Article 32(2) MMF Regulation.

⁹⁸ Article 33(2)(b) MMF Regulation. This means that the LVNAV MMF can provide for redemption at par if two conditions are simultaneously satisfied: 1) the “NAV per share” calculated according to the amortised methodology of Article 29(7) is equal to or higher than 0,995 €, the MMF can round its “NAV per share” to 1 €; 2) “NAV per share” calculated according to the methodology of Article 30, i.e., according to the mark-to-market and mark-to-model methodology rounded to the nearest basis point, does not deviate from the “NAV per share” calculation under 1 by more than 20 basis points.

For instance, if the “NAV per share” calculated under 1) is equal to 0,99 but the “NAV per share” calculated under 2) is equal to 0,96, the LVNAV fund cannot issue or redeem share at par, i.e., 1 €, but only at 0,96 € as a “normal” VNAV fund.

⁹⁹ Recital (48) MMF Regulation.

¹⁰⁰ Article 34(1)(a)(i) MMF Regulation.

¹⁰¹ Article 34(1)(a)(ii) MMF Regulation.

¹⁰² Article 34(1)(a)(iii) MMF Regulation.

¹⁰³ Article 34(1)(b) MMF Regulation. According to the regulation, the infringement is serious, and decisions cannot be postponed any longer if the proportion of weekly maturing assets falls below 10%.

¹⁰⁴ Article 37(3)(c) MMF Regulation.

Finally, it is important to underlie two further rules that aim at safeguarding financial stability and limiting contagion. First, the regulation explicitly bans external support to back the promise of any money market fund.¹⁰⁵ This provision is essential as it prevents the crisis from spreading to sponsoring institutions, often banks, that put forward a liquidity line to support the credibility of MMFs' promise to redeem at par. Moreover, a more subtle but no less important provision prevents MMFs from engaging in securities lending,¹⁰⁶ an activity whereby liquid financial assets, eligible under the regulation, can be lent to other investors against less liquid collateral and a fee. This also represents an issue of great concern for financial stability in relation to the shadow banking sections.¹⁰⁷

At this point, it is worth noting that the issue of MMFs acting as shadow banks is largely a concern of the past, at least in the EU. Redemption at par is not possible anymore for the holders of shares in MMFs, where the liquidity mismatch between assets and liabilities can become severe. MMFs can opt to increase their margins by performing some liquidity transformation and accepting to issue or redeem shares at the current NAV, getting the VNAV authorisation. Alternatively, they can stick to the redemption at par promise and dramatically limit their possibility to perform liquidity transformation and get the CNAV authorisation. As anticipated, LVNAV MMFs lie in the middle. These still have the possibility to engage in some liquidity transformation; however, the possibility of guaranteeing redemption at par is limited.

More generally, the set of rules discussed so far serves the goal of preserving financial stability, whereas the more general UCITS and AIF directives serve the purpose of protecting investors and preserving market integrity. Crucially, both are needed given the short-term, money-like promise embedded in the money market fund business model.

These latter considerations are not only useful for assessing the efficacy of the MMF Regulation in making the financial system more resilient to liquidity shocks. These are also functional to inform the discussion on the regulatory regime on stablecoins in terms of the possibility of guaranteeing the stable value of a short-term debt claim, liquidity management, and early mechanisms to avert runs.

¹⁰⁵ Article 35 MMF Regulation.

¹⁰⁶ Article 9(2)(d) MMF Regulation.

¹⁰⁷ T. Adrian, et al., "Repo and securities lending", in M. Brunnermeier and A. Krishnamurthy (eds.), *Risk topography: Systemic Risk and Macro Modeling* (Chicago: University of Chicago Press, 2013).

3.3 Competing policy goals in regulating Money Market Funds

After the critical review of the history and the new regulation pertaining MMFs, it is important to conceptualise the old and new regimes in terms of (divergent) regulatory goals.

Before the Global Financial Crisis, MMFs were chartered as traditional investment undertakings while guaranteeing C-NAV. Their initial status can be understood as a way to foster both investor protection and innovation in the provision of financial services, to the detriment of financial stability. Investors in money market funds enjoyed strong legal entitlements from various sources. First, through the construction of MMFs, issuing preferred shares that were redeemable on demand. Second, investors were protected by the applicable regulation (UCITS or AIFM, depending on the type of fund) that was focused on investor protection. Third, investors were protected in their expectation to redeem at par, at all times, by the liquidity put of sponsoring banks that were often issued, acting as a private bail-out mechanism. On the other hand, the initial discussion on whether MMFs should be attracted into the realm of deposit-taking institutions was discarded on formalistic grounds.¹⁰⁸

In contrast, the new regime designed for C-NAV MMFs represents an example of regulatory design focusing on financial stability and investor protection. The constant net asset value of the claim can only be guaranteed if the fund follows strict requirements in terms of asset quality and maturity.

The other types of short-term MMFs represent a compromise between protecting investors and allowing the funds to engage in profitable and risky activities. The “price” for performing such activities is that the funds cannot guarantee the redeemability at constant net asset value, with various nuances depending on the type of MMFs. However, the main focus is still on the preservation of financial stability, as confirmed by the applicability of the crisis management tools, such as redemption gates and liquidity fees.

This sort of reasoning is important to understand the regulatory approach to stablecoins and to support the normative claim of this article, which is to align the regulatory regime of stablecoins to the one applicable to money market funds, in line with the “same business, same regulation” principle.

¹⁰⁸ Gorton and Zhang, n 14 above.

4. Stablecoins: private money for the digital age

4.1 Defining stablecoins

There is still no unanimously accepted definition of stablecoins. However, given the regulatory purpose of this article, the definition provided by the Financial Stability Board (FSB) in its latest report seems the most apt. Accordingly, stablecoins are a special category of crypto-assets that “purport”¹⁰⁹ to maintain a stable value referencing physical, financial or crypto-assets (asset-linked stablecoins) or via specific protocols adjusting supply in response to a change in demand (algorithmic stablecoins). Stablecoins aim to address the main shortcoming of the “first generation” of cryptocurrencies, such as bitcoins, which is the excessive volatility of their value, so as to provide a store of value and medium of exchange to the crypto economy.

The key design feature of stablecoins is, therefore, stabilisation. To understand the financial stability concerns and the regulatory implications of stablecoins, one must consider three aspects of stabilisation: the peg, the stabilisation mechanisms, and the collateralisation.¹¹⁰

The first salient choice in the design of a stablecoin is the peg, i.e., the currency or basket of assets that the stablecoin aims to replicate. Currently, most stablecoin projects use the US dollar as a peg as it is widely considered a stable store of value worldwide.¹¹¹

The second crucial design feature is the stabilisation mechanism. Broadly speaking, there are two mechanisms to stabilise the price of the coin and match the peg: physical reference and algorithmic-based stabilisation.¹¹² Stabilising a coin through physical reference means that the issuer holds reserves backing the value of the stablecoins. In contrast, algorithmic stabilisation is based on the idea of automatically adjusting through an algorithm the supply of coins to match the peg and guide the user’s expectation of the future value of such coins.¹¹³ Functionally,

¹⁰⁹ On the ambiguity of the terms, see n 16 above.

¹¹⁰ A. Moin, K. Sekniqi, E. Sirer, “SoK: A classification framework for stablecoin designs” in J. Bonneau and N. Heninger (eds) *International Conference on Financial Cryptography and Data Security* (Berlin: Springer, 2020). The paper also includes “price information”, which is disregarded here.

¹¹¹ Some projects also peg their coins to other currencies, such as the Euro and the Swiss Franc, or even to commodities, such as gold.

¹¹² There are hybrid and secondary mechanisms to reinforce stabilisation, such as fees, secondary units, redemption limits, and the like, aiming to complement the main stabilisation mechanisms. D. Bullmann, J. Klemm and A. Pinna “In search for stability in crypto-assets: are stablecoins the solution?” (ECB Occasional Paper n. 230, 2019), 29.

¹¹³ *Ibid*, 26.

this looks much more like a “private” central bank, so much so that the proponents of this type of stablecoins labelled their projects as “algorithmic central banks”.

Finally, the last key design element for a stablecoin is the reserves, precisely their type, quality, and amount. In algorithmic stablecoins, the discussion on reserves is short and straightforward: there are no reserves, and the value of the coin is supported by the reliability of the algorithm and the user’s expectations. In contrast, reserves are the key element for stablecoins that physically reference a peg. In this case, the value of the coin derives from the value of the reserves.

The quality and the amount of reserves are crucial in shaping liquidity risk as these elements define the level of liquidity transformation performed by the issuer. Stablecoins can be backed by the same fiat of the peg, for instance, the US Dollar, or by a basket of various currencies, commodities and financial instruments or even by a basket of crypto-assets. This latter possibility makes the stabilisation mechanisms completely on-chain, as reserves are held in the same blockchain where the coins are issued, without resorting to off-chain methods like bank custody. In this case, stablecoins are usually overcollateralised to hedge the volatility of the crypto-assets.

In contrast, most stablecoins are currently backed by off-chain reserves, which are usually not limited to one currency since it would be unprofitable for the issuer. At the same time, this creates liquidity risk. A growing and worrisome tendency is to undercollateralised stablecoins, increasing leverage. This is the case, for instance, of Tether, the most widespread stablecoin in the world. In this case, secondary stabilisation mechanisms, such as liquidity fees and redemption restrictions, come into play.

These design features impact on financial stability risk inherent to cryptocurrencies, especially when it comes to the stabilisation mechanism and the reserves backing the value of the coins, as will be discussed in the next section.

4.2 The economics of stablecoins

The promises and risks of stablecoins for the development of the crypto economy and for financial stability are largely a function of their technological design features and applicable law. This section focuses on the economic mechanisms underpinning the design of stablecoins, highlighting the risk inherent in them.

The analysis focuses on three aspects. First is the liquidity risk inherent in stablecoins, detailing the functional equivalence between stablecoins and money market fund shares. Second is the potential role of stablecoins as perceived “safe assets” in the crypto economy. Third and final is the alleged role of stablecoins as an alternative means of payment.

The discussion on the liquidity risk of stablecoins is centred around the stabilisation mechanism. For coins whose stabilisation mechanism is physical reference, there is a clear functional resemblance between (asset-referenced) stablecoins and money market fund shares. To better grasp this, it is worth distinguishing between the pool of assets aiming to back the coin holder's claim and the asset class that the stablecoin references as a peg.¹¹⁴ For instance, a stablecoin can be pegged to the US Dollar, meaning that the issuer purports to guarantee the stability of the value of the stablecoin at 1\$, exactly as MMFs used to do with their shares. At the same time, such a promise is backed by a basket of instruments that may include but are not limited to the USD. Again, the construction mirrors that of MMFs and the liquidity risk increases as the illiquidity of the basket of reserves increases. However, this decreases the margin for stablecoin providers as it curbs any type of liquidity and risk transformation.

The analysis of the post-crisis reform of MMFs evidenced that allowing all types of MMFs to guarantee redemption at par is nowadays forbidden as it generated systemic risk and boosted the financial crisis. So much so that both US and EU post-crisis regulation opted for tight regulation of "Constant Net Asset Value" MMFs, whereas other types can only guarantee low volatility or a variable price of redemption. Given the functional similarity of the two instruments, one would expect the same regime to apply. However, such an expectation may be frustrated by the willingness of the policymakers to prioritise other – competing – policy goals.

Another key functional similarity is the dynamic link between assets and liabilities. Both stablecoin providers and money market funds must generate coins and issue shares respectively in exchange for clients' money which is, in turn, invested in assets according to the portfolio strategy pursued by the stablecoin issuers or money market funds. This model works smoothly in creating (issuing) coins (shares) so long as the market liquidity of the portfolio assets is high and their available quantity is abundant in the market.

Conversely, suppose coins (share) holders want to redeem their claim and convert that back into fiat. In that case, the asset side of the balance sheet must shrink accordingly, selling some of the portfolio assets to satisfy clients' requests for redemption. If both market and funding liquidity are high, these creation and redemption mechanisms do not represent an insurmountable problem. However, if redemption requests are higher than expected, i.e., funding liquidity dries up, the issuer of coins (MMF) will need to sell some of its assets to face these withdrawals. Should market liquidity be low, these sales may prove extremely problematic and

¹¹⁴ Financial Stability Board, n 9 above, 10.

may happen at “fire sale” prices which, in turn, would generate more redemptions. Clearly, this is more problematic the higher the level of liquidity transformation performed by the issuer of the coins.

Therefore, from a liquidity risk perspective, pegging a stablecoin to the USD and backing that stablecoin to the USD is functionally equivalent to issuing shares of a “Public Debt” MMF that are backed for 99,5% by currencies and public debt.¹¹⁵ In contrast, pegging a stablecoin to the USD and backing it with a basket of different securities is functionally equivalent to a “Prime” MMF.¹¹⁶

Crucially, the law governs the nature of the claims of the coin holders. As seen for MMFs, the possibility to offer a Constant Net Asset Value, which is equivalent to pegging a stablecoin to a fiat currency, depends on the type of licence the fund possesses and the constant abidance to a series of stringent requirements. Conversely, should the fund lack the necessary licence or fail to abide by those requirements, the law governs convertibility differently. In this sense, convertibility and the attached liquidity risks are a legal construction.¹¹⁷ This is also shown by the previous regime applied to MMFs, where the convertibility of shares into fiat was regulated differently.

The discussion is radically different for algorithmic stablecoins, where the activity of creating and destroying coins is much more like the monetary activities of modern central banks, whereby generating a strong perception of reliability and guiding users’ expectations represent the cornerstones of stability. However, the algorithm lacks the reputational capacity of modern central banks and the fiscal backstop provided by the State, so the first attempts with algorithmic stablecoins were limited in the volume of coins created with a high probability of default due to a sudden loss of confidence.

However, contingent on the development of the technology and the growth of blockchain-based economic activities, both in size and number of users, the algorithmic stablecoins could represent the most disruptive innovation in terms of monetary supply, posing regulatory challenges that are even difficult to conceptualise at this stage. Therefore, the discussion will mainly focus on physical reference stablecoins.

The second feature shaping the liquidity risk of stablecoins is the role that stablecoins perform in the crypto economy and, more specifically, in decentralised finance (DeFi). In this perspective, stablecoins perform a threefold service: first,

¹¹⁵ CNAV funds in the new EU regulation.

¹¹⁶ LVNAV or VNAV funds in the new EU Regulation.

¹¹⁷ On the key role of convertibility in regulating disintermediated finance, see Kaja, Martino and Paces, n 7 above, 92.

they allow DeFi users to avoid converting from and to fiat money, leaving funds locked in the blockchain. Second, and as a consequence, they are the perfect bridge between crypto and traditional financial systems. The third characteristic is, again, consequential to the previous ones: stablecoins are increasingly perceived as a “safe asset” for the crypto economy, a “flight to” asset to hedge the volatility of other crypto tokens,¹¹⁸ and a medium of exchange to increase the liquidity of the crypto economy as a whole.¹¹⁹

Given this role, it is no surprise that many DeFi applications are already engaging in a form of securities lending, whereby they borrow stablecoins against high-interest rates, de facto encumbering stablecoins.¹²⁰ Once again, encumbering “safe” assets is nothing new and can become particularly problematic for market illiquidity, incentivising runs.

The perception of stablecoins as “safe” assets for the crypto economy entails a further drawback. In times of high crypto volatility, one can expect stablecoins to be a “flight to” asset. This, in and of itself, can be considered beneficial for the stability and liquidity of the coins, as it means that in times of stress, resources are flowing to stablecoins. However, to maintain the stability of the value, in times of high demand, the supply of stablecoins should increase to accommodate the incoming resources. In turn, this may increase liquidity mismatch considerably since stablecoin issuers may face a shortfall of high-quality reserves.

The final element of the analysis pertains to the role of stablecoins as an alternative means of payment. This represented the initial selling point of the more far-reaching stablecoin projects, such as Facebook Libra.¹²¹ However, this economic function of stablecoins seems recessive compared to what has been discussed so far. The fact that Facebook retracted its stablecoin projects confirms, at least anecdotally, this view.¹²² This clearly has policy implications. At least at this technological stage,

¹¹⁸ A. Chernoff, “Stablecoins: Hedging Against Market Volatility” (Medium, 18 March 2020), at <https://medium.com/shapeshift-stories/stablecoins-the-hedge-against-market-volatility-cc5d9dad04ff> (last visited 30.08.2022).

¹¹⁹ S. Aramonte, W. Huang and A. Schrimpf, “DeFi risks and the decentralisation illusion.” (BIS Quarterly Review, December 2021), at https://www.bis.org/publ/qtrpdf/r_qt2112b.htm?utm_campaign=This%20week%20in%20fintech&utm_medium=email&utm_source=Revue%20newsletter (last visited 19.09.2022).

¹²⁰ F. Coppola, Why Stablecoin Interest Rates Are So Damn High (CoinDesk, March 7 2022), at <https://www.coindesk.com/layer2/2022/03/07/why-stablecoin-interest-rates-are-so-damn-high/> (last visited 30.08.2022).

¹²¹ Diem, “How the Diem payment system works”, at https://www.diem.com/en-us/vision/#how_it_works (last visited 30.08.2022).

¹²² On this issue, see also R. Garrat et al. “The Future of Payments Is Not Stablecoins” (Liberty Street Economics, 7 February 2022), at <https://libertystreeteconomics.newyorkfed.org/2022/02/the-future-of-payments-is-not-stablecoins/> (last visited 30.08.2022).

the regulator should not consider payments as the driving element in building a stablecoin framework.

4.3 Stablecoins in the shadow of the law

Designing effective and efficient regulation for new phenomena is a complex task. However, new phenomena such as stablecoins aim to address long-lasting human problems. Accordingly, their design share several feature with previous attempts to solve these problems. Hence, policymakers are not shooting in the dark but can resort to regulatory models already experimented with and adapt such models to the novelties brought about by the blockchain technology and to the policy goals they choose to prioritise.

This section provides a snapshot of the key regulatory variables related to liquidity and, more generally, financial stability risks posed by stablecoins. This exercise has a twofold usefulness. First, it helps to appreciate how different variables can be intertwined to foster different policy priorities. Second, it will prove helpful in assessing the regulatory design adopted in MiCA.

The design of different regulatory frameworks for stablecoins can be disentangled into four main regulatory variables: the point of entry for regulation, the design of the obligations on the issuer, the supervisory powers, and, finally, the crisis management tools.

The first and arguably most relevant design feature of the regulatory framework for stablecoins is determining the point of entry for regulation, i.e., how the regulation applies to the issuer of stablecoins. The two available models are entity- and activity-based regulation.

According to the entity-based, the law restricts the possibility of carrying out specific activities, imposing a licensing regime. Acquiring the licence has two main implications. First, the authorised entity can perform the activity, for instance, issuing stablecoins. Second, to maintain the licence, the entity is subject to the whole regulatory framework imposed on issuers of stablecoins. The focus is on the legal nature of the entity carrying out the regulated activity.

The activity-based approach requires all entities carrying out a certain activity to comply with the applicable regulation. The focus is on creating a level-playing field for the active players in a particular market segment, regardless of the legal nature.

Financial and banking regulation is dominated by entity-based, where sensitive activities are reserved for licensed entities. The most prominent example is the need to hold a banking licence to carry out banking activities. This facilitates the setting of minimum standards to safeguard investors and financial stability. It also decreases monitoring costs and facilitates prudential supervision. On the other

hand, entity-based regulation restricts competition and incentivises regulatory arbitrage, whereby non-licensed entities try to carry out activities that are functionally equivalent to a regulated one but do not fall within the legal definition of the regulated activity. For instance, money market funds can be considered an unintended consequence of the entity-based approach to regulating banking activities.

The second variable is the design of the obligations imposed on the entity carrying out the regulated activity. These obligations can cover a wide array of aspects, from fit and proper requirements for shareholders to minimum capital requirements. Given the scope of the article, the relevant aspects are the obligations imposed on the asset side of the stablecoin issuers, i.e., the treatment of reserve assets and the obligations on the structure and legal nature of the liability side of the balance sheet, i.e., the existence of a minimum capital requirement and the rights granted to the token holders. The design features of these obligations can vary considerably, also in relation to the choice made between entity- and activity-based regulation and the supervisory approach. Nonetheless, one can differentiate between obligations designed as standards and obligations designed as rule-based substantive requirements.¹²³

In financial regulation, standard-based requirements often materialise in obligations to draft, maintain, and implement policies in various areas, such as governance arrangement, liquidity management, and so forth. Rule-based substantive requirements often set specific thresholds the entity has to comply with. The regulation of MMFs discussed in section 4.2 offers many examples. For instance, to offer C-NAV shares, the entity shall invest 99,5% of the reserves in money market instruments and so forth. The two approaches are often blended, with some regulatory features designed as rules and others as standards.

The possibility of performing liquidity transformation is, by and large, determined by the design of the obligations of stablecoin issuers on their assets and liabilities. Controlling liquidity risk does not necessarily require extremely strict, rule-based regulation on both assets and liabilities. For instance, policymakers grant stablecoin issuers considerable flexibility in the treatment of reserve assets. This does not, per se, generate liquidity transformation. It does so only insofar as the obligations on the liability side allow the issuer to promise liquidity on demand.

It is important to highlight that rule-based regulation has a higher preventive potential. In contrast, standard-based regulation aims at setting a minimum standard while leaving considerable flexibility to the regulated entity and the market player

¹²³ To frame the rules vs standard debate, see Kaplow, Louis. "Rules versus standards: An economic analysis." *Duke Lj* 42 (1992): 557.

to determine the efficient solution. In the specific case of stablecoins, designing the obligations of the issuers following a standard-based approach on both sides of the balance sheet promotes innovation, incentivising issuers to set up new and more efficient business models to attract new investors. However, it considerably hampers the preventive potential of regulation.

This mechanism is particularly problematic when applied to private money since investors and consumers have an interest in acquiring information on the level of protection offered by the liquidity management policy of issuer A compared to that of issuer B. As discussed in Section 2.2, the necessity to acquire specific information on the issuer of private money contrasts the “information insensitive” principle and increases the instability and fragility of the issuer.

The third variable is the design of the powers granted to the supervisory authority. This design feature is tightly intertwined with the first two variables. The supervision of activity-based regulation is costly and remarkably complex. On the other hand, the supervision of standard-based regulation is often focused on iterative processes whereby the supervisor engages in dialogue with the supervised stablecoin issuer to ameliorate the “draft, maintenance and implementation” of the required policies. This is often characterised by mild and reactive powers.

On the other side of the spectrum, supervisors can be entrusted with preventive powers, such as the power to impose prompt corrective measures if the ongoing supervision reveals potential fragilities. A complement to these measures is usually the possibility of running stress tests on supervised entities. Finally, regulation can also grant supervisors macro-prudential powers, whereby the preventive supervisory measures are not directly linked to the specific risk posed by one issuer but to the market as a whole.

From a financial stability perspective, strong and preventive supervisory powers are pivotal to averting idiosyncratic crises and limiting the build-up of systemic risk. However, supervisory actions are also a form of market signal and can trigger panic leading to supervisory forbearance. On the other hand, more lenient and dialogue-based supervision may not be effective enough to avert idiosyncratic or systemic crises but reduces the risk of triggering market panics.

Finally, the fourth variable is the design of crisis management tools. The acknowledgement that the design of bankruptcy or pre-bankruptcy tools is crucial to regulate financial institutions is relatively recent. In the aftermath of the Global Financial Crisis, it became clear that traditional bankruptcy procedures do not fit the failure of a financial institution because of the potential systematic spillovers. Special crisis management tools can take different forms, depending on the type,

size, and business model of different institutions. However, they all aim to minimise the adverse systemic effects generated by the crisis of these entities.

On the one side of the spectrum, the regulation does not provide any special crisis management tools, leaving the potential bankruptcy of stablecoin issuers to national insolvency laws. On the other side, the regulation can set out a special resolution regime for the insolvency of stablecoin issuers, similar to what has been done for banking institutions. Another possibility is to provide early crisis management tools, such as redemption gates, redemption fees, and the like, tailored to the new provision of money market funds.

5. Stablecoin Regulation under MiCA

The Market in Crypto-Assets (MiCA) Regulation is part of the Digital Finance Package, aiming to unleash the potential of digital finance in innovation and competition.¹²⁴ This represents the explicit policy goal of the European policymaker. In other terms, a key policy objective of the entire Digital Finance Package and, specifically of MiCA, is to create a regulatory environment that is attractive for the development of the crypto economy in the EU. However, building on the analytical framework proposed earlier, this comes at the cost of either investor protection or financial stability.

The Regulation encompasses various aspects related to the crypto economy. This section refers to the final version of MiCA Regulation, approved by the Council of the European Union on October 5th, 2022. Whenever relevant for the analysis, the article will provide some account of MiCA's legislative developments, starting from the proposal issued by the Commission in September 2019 ('original proposal')¹²⁵ and amendments proposed by the Parliament on June 30th, 2022 ('amended proposal').¹²⁶

The two main bodies of rules pertain to the creation, issuance, and governance of crypto-assets¹²⁷ and, on the other hand, the regulation of various crypto-assets service providers.¹²⁸

¹²⁴ MiCA Explanatory Memorandum, 1.

¹²⁵ See *supra*, note 21

¹²⁶ See Council of the European Union, "Digital finance: agreement reached on European crypto-assets regulation (MiCA)" (June 30th, 2022) at (last visited 20.08.2022). For a useful comparison between the original Commission proposal and the amendments proposed by the Parliament and the Council, see Council of the European Union, "MiCA: Proposal for a Regulation on Markets in Crypto-Assets - Three-column table to commence trilogues" (April 1st, 2022).

¹²⁷ Title II-IV MiCA.

¹²⁸ Title V MiCA.

The regulation follows an entity-based approach to financial regulation.¹²⁹ Consequently, the authorisation to carry out certain activities, such as the issuance of crypto-assets, represents the cornerstone of the regulatory framework. The authorisation requirements mainly focus on the ability of the entity to adequately protect investors and preserve “market integrity”. Once the competent authority grants the licence to carry out a certain activity, the regulation does not impose stringent requirements. Rather, it mainly mandates the licensed entity to set up policies and arrangements, demanding the competent authority to supervise the correct implementation of such policies and the general compliance with the regulation.¹³⁰

Conceptually, this regulatory approach follows the traditional “Law & Finance” literature according to which investor protection and market efficiency foster financial development.¹³¹ In this setting, law matters for finance to the extent that it allows vindicating rights effectively, determining the degree of investor protection. However, as previously discussed, this approach is at least partial.¹³²

The Global Financial Crisis showed that strong investor protection helped boost and reinforce the crisis when liquidity dried up and investors had to adjust their strategy.¹³³ In other terms, the traditional Law & Finance literature assumed liquidity to be a free good.¹³⁴

This is the most contentious point of the stablecoins’ regulatory framework. Investor protection as a policy goal does not guarantee per se innovation and resilience. In contrast, a legal framework that is inattentive to liquidity risk and, more generally, to financial stability may generate systemic risk and increase instability.

The MiCA regulates crypto-assets in general as well as two subcategories of those: “asset-referenced tokens” and “e-money tokens”.¹³⁵ Crypto-assets are defined as a

¹²⁹ On the debate between activity- and entity-based regulatory approaches to fintech, see F. Restoy, “Fintech Regulation: How to Achieve a Level Playing Field” (Financial Stability Institute Occasional Papers n. 17, 2021) at <https://www.bis.org/fsi/fsipapers17.htm> (last visited 30.08.2022).

¹³⁰ Title VI MiCA.

¹³¹ La Porta, n. 45 above. For a critique of the empirical findings of the Law and Finance literature, see H. Spamann, “The “Antidirector Rights Index” Revisited” (2010) 23 Rev Financ Stud, 467.

¹³² For a theoretical critique of the original “Law and Finance” approach, see Pistor, n 17 above, 324.

¹³³ In this regard, the role of “bankruptcy safe harbours”, exonerating from mandatory stay creditors whose claim was assisted by financial collateral represents the perfect example. See Paech, n 47 above. More generally, on the legal construction of shadow banks, see Nabilou and Paces, n 57 above.

¹³⁴ Pistor, n 17 above, 325.

¹³⁵ The MiCA Regulation will be applied to the “persons that are engaged in the issuance of crypto-assets” unless these already qualify as financial instruments under Mifid II (Directive 2014/54/EU). See Article 2(1)(a) MiCA. Moreover, MiCA does not generally apply to crypto-assets issued by

“digital representation of value or rights which may be transferred and stored electronically, using distributed ledger technology or similar technology”.¹³⁶

Building on this general definition, the regulation further defines *asset-referenced token* (ART) as “a type of crypto-asset [...] that purports to maintain a stable value by referring to any other value or right or a combination thereof, including one or more official currencies;”.¹³⁷ Finally, *e-money tokens* (eMT) are defined as “a type of crypto-asset that purports to maintain a stable value by referencing to the value of one official currency;”.¹³⁸

MiCA does not directly define algorithmic “stablecoins”. However, these are mentioned in the preamble to the Regulation, defined as crypto-assets that aim at maintaining a stable value via protocols that provide for the increase or decrease of the supply of such crypto-assets in response to changes in demand. There it is explicitly stated that algorithmic stablecoins should be considered Asset-Referenced Tokens for the purpose of the regulation; hence, they should comply with all the obligations imposed on the issuers of ARTs.¹³⁹ As Section 5.1 will detail, this is not possible since the regulatory design of ART is tailored on stablecoins that are backed by assets.¹⁴⁰ Therefore, I see two possibilities. First, algorithmic stablecoins will be, *de facto*, not issued in the EU because of the impossibility to comply with the ART regulatory regime, leaving them largely unregulated. Second, the ART regime will be applied only in as much as it is consistent with the technological design of the algorithmic stablecoins, which is basically only the part related to the authorization and the white paper.¹⁴¹ Both solutions imply little to no adjustment for liquidity risks. This is worrisome as the recent commotion in the area of stablecoins originated from the collapse of an algorithmic stablecoin.¹⁴²

Looking at these definitions, the analogy between money market funds and stablecoins becomes material at both conceptual and regulatory levels. The generic

credit institutions. Only the provisions on the mandatory publication of the white paper and on the own funds requirement apply. See article 2(4) MiCA.

¹³⁶ Article 3(2) MiCA.

¹³⁷ Article 3(3) MiCA.

¹³⁸ Article 3(4) MiCA.

¹³⁹ Recital 26 MiCA.

¹⁴⁰ For a categorization of stablecoins, see K. Bruce, C. Odinet and A. Tosato, “The Private Law of Stablecoins” (2022) *Arizona State Law Journal*, Forthcoming.

¹⁴¹ This is one interesting case where the final version of MiCA totally inverts the original proposal, where the Recital 26 explicitly stated that algorithmic stablecoins were not to be considered ART so that the ART’s regulatory regime could not apply. See Recital 26 MiCA Proposal.

While the original proposal created a legal vacuum for algorithmic stablecoins, the final version generates a legal non-sense.

¹⁴² A. Briola, et al., “Anatomy of a Stablecoin’s failure: The Terra-Luna case.” *Finance Research Letters* (2022), 103358.

category of crypto-assets that are not algorithmic stablecoins does not generate financial stability issues related to liquidity risk since these seek to promise neither security nor liquidity. Therefore, a regulatory regime that seeks to protect investors from fraud and deception is adequate.

MiCA Regulation	MMF Regulation
Algorithmic Stablecoins	UCIT/AIF (MMF pre-reform)
Asset-Referenced Tokens	Variable-NAV MMF
E-Money Tokens	Constant/Low Volatility Net Asset Value MMF

Table 1 – Functional equivalence between MMF Regulation and MiCA categories

In contrast, the focus of the analysis is on those crypto-assets that “purport to maintain a stable value” since they seek to implicitly guarantee safety and liquidity. Additional functional similarities can be established between stablecoins and MMFs in the construction of the different regulatory categories (see Table 1).

The regulation for *asset-referenced tokens* (ARTs) resembles that of Variable NAV MMFs. This shapes the business model of ART issuers and the liquidity risk it entails. Similarly, the regulation of *e-money tokens* (eMTs) resembles a mix between Low Volatility and Constant NAV MMFs so that liquidity risk is limited. As for algorithmic stablecoins, the solution provided by the European policy-maker is inapplicable and, in the best case scenario, the general regime on crypto-assets with few corrections when it comes to the authorization procedure will be applicable, making them functionally similar to the position of money market funds before the recent reforms.

The remainder of the section details the key elements of the regulatory regime of each of these categories of stablecoins, highlighting the specific policy goal pursued by the regulation and the shortcomings in terms of financial stability.

5.1 The Regulation of Stablecoins: Asset Referenced Tokens

Asset referenced tokens are a form of stablecoins in which the stability of the peg is based upon the quality of the reserves and the rights provided to stablecoin holders. The issuers of ARTs are allowed a considerable degree of flexibility when it comes to the quality and the use of the reserves, as well as the design of the rights stablecoin holders should be entitled to.

Looking at the current dynamics of the stablecoin market, the vast majority of stablecoins would fall under this discipline, so that we can expect few issuers opting for the much more stringent discipline of eMoney Tokens. With this in mind and building on the previous discussion on competing policy goals, the regulation on ARTs can be conceptualised as a way to guarantee a high degree of protection to prospective investors so as to increase trust and usability while supporting innovation, i.e., incentivise issuers to get the European licence and issue stablecoins in the EU.¹⁴³ The regulation also provides for some adjustments for financial stability. However, “investor protection” and “fostering innovation” remain the policy priority of the European policymaker, with a strong emphasis on investor protection.¹⁴⁴

The analysis of the regime for ARTs and its policy priorities focuses on five key aspects: the authorisation regime, the obligations of the issuers on assets and liabilities, the special regime for “Significant Asset Referenced Tokens”, and the rules dealing with the crisis of an ART issuer.

5.1.1 Authorisation and General Provisions

To start with the authorisation regime, the issuance of crypto-assets integrating the definition of asset referenced tokens¹⁴⁵ is reserved for legal entities established in the EU and with a specific licence.¹⁴⁶ To obtain such authorisation, the issuer shall submit appropriate documentation to the competent authority on the issuer's legal status and governance arrangement and on the fit and proper status of the management and controlling shareholders.¹⁴⁷

Most importantly, the issuer must also submit the “crypto-asset white paper” whose main purpose is to provide clear, not misleading, concise, and comprehensible information to the prospective investor. The crypto-asset white paper functionally resembles the prospectus for securities offered to the public.¹⁴⁸ The white paper aims to balance investor protection and regulatory competition insofar as it is much less stringent in terms of disclosure obligation and compliance costs than the

¹⁴³ On the link between trust and financial applications of the blockchain technology, see B. Bodó, P. De Filippi, “Trust in Context: The Impact of Regulation on Blockchain and DeFi” Regulation and Governance (Forthcoming) Cheltenham.

¹⁴⁴ The amended proposal by the European Parliament was more attentive to the financial stability and investor protection elements compared to the original proposal by the Commission, whereas the amendment has considerably reduced the emphasis on fostering innovation.

¹⁴⁵ Article 3(3) MiCA.

¹⁴⁶ Asset referenced tokens can also be issued by entities with a banking licence, so long as the white paper of the issuance is approved by the competent authority. See article 15(4) MiCA.

¹⁴⁷ Article 16(2) MiCA.

¹⁴⁸ REGULATION (EU) 2017/1129 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 14 June 2017 on the prospectus to be published when securities are offered to the public or admitted to trading on a regulated market, and repealing Directive 2003/71/EC.

prospectus regulation but still guarantees prospective investors some level of information.¹⁴⁹

Financial stability is clearly in the background. The only minor adjustment at this stage is that the competent authority shall refuse to grant the authorisation, among other reasons, in case of “serious threat to financial stability, the smooth operation of payment systems, market integrity, or exposes the issuer or the sector to serious risks of money laundering and terrorist financing”¹⁵⁰ or in case the ECB provide a negative opinion to the authorisation “on grounds of smooth operation of payment systems, monetary policy transmission, or monetary sovereignty”.¹⁵¹ However, this seems to reflect the widespread concern about monetary competition posed by far-reaching projects, such as Facebook Diem, now retracted.¹⁵²

5.1.2 The Regulation of Liability Side

The second key element of ART regulation consists of the obligations of the authorised issuers. Once again, many of these obligations focus on investor protection and aim at increasing the trust and usability of stablecoins.¹⁵³ However, this part also disciplines the obligations of the issuer in managing the asset and liability sides of its balance sheet, focusing on reserves and the status of tokens. These rules strike a balance between the policy priority of protecting investors while fostering innovation and, on the other hand, safeguarding financial stability.

On the asset side, the issuer must disclose the nature of the reserves of assets already in the white paper.¹⁵⁴ The assets used as reserves are the core feature of the stabilisation mechanism for physical reference stablecoins, such as ARTs. Outstanding tokens should always match the amount of reserves and vice versa.¹⁵⁵

¹⁴⁹ Article 17(5) requires including a ‘clear and unambiguous’ statement that (a) the ARTs may lose their value in part or in full; (b) the ARTs may not always be transferable; (c) the ARTs may not be liquid. This provision wants to make investors aware of the risk of stablecoins, but does not curb these risks, so that it can still be understood as a provision aiming at protecting investors through disclosure.

¹⁵⁰ Article 19(2)(c) MiCA.

¹⁵¹ Article 18(4) and 19(2a) MiCA.

¹⁵² D. Zetzsche, R. Buckley, D. Arner, “Regulating Libra” (2021) *Oxford Journal of Legal Studies*, 41(1), 80-113.

¹⁵³ Among these, Article 23 introduces some conduct of business rules, Articles 24-26 discipline marketing communication and ongoing information, Article 27 requires the issuer to set up a complaint handling procedure, and Articles 28-29 set requirements to prevent, identify, manage and disclose conflict of interest. All these obligations closely mirror Mifid II provisions.

¹⁵⁴ Article 17(1)(b) MiCA.

¹⁵⁵ The amended formulation proposed by the European Parliament entitles even more the holders of ARTs, requiring that “the aggregate value of reserve assets shall always be at least equal to the aggregate face value of the claims on the issuer from holders of asset-referenced tokens in circulation”. Article 32(1) MiCA – Amended Proposal. Interestingly, the proposed amendment by the Parliament formulation raises the problem of the valuation of reserve assets but only requires expressing all of them in the same official currency for the sake of consistency and transparency. In

Therefore, the issuer shall ensure the effective and prudent management of such assets.¹⁵⁶ To this end, each issuer must have a clear and detailed policy describing the stabilisation mechanism of the token. Specifically, the issuer should describe the type of assets included in the reserves and assess the credit, market, and liquidity risk of such assets.¹⁵⁷ Moreover, the policy should describe the mechanisms for the creation and destruction of tokens and how that relates to the increase and decrease of the reserves. A key innovation of the final version of MiCA is the regulation of valuation models,¹⁵⁸ bringing it close to the MMF Regulation approach.¹⁵⁹ Issuers of ARTs should value the reserves using mark-to-market approach whenever possible or, alternatively, mark-to-model approach if the data allows so, thus limiting the used amortised cost method.

It should be noted that, given these regulatory requirements, in case of a sudden increase or decrease in outstanding tokens, there may be a significant jump in the level of liquidity transformation. In case of massive inflows of funds, the issuer may be tempted or forced to increase the reserves with relatively illiquid assets because of a shortage of safe and liquid assets or to increase the profitability of their venture. That is likely to happen in a boom. Conversely, in case of sudden and massive outflows, the issuer will be forced to liquidate part of the reserve assets to match the withdrawals. In this case, the issuer will first liquidate the most liquid assets, increasing once again the liquidity mismatch. This is likely to happen in periods of turmoil and may weaken the liquidity position of the issuer to the extent of triggering a run.¹⁶⁰

Even more so considering that the issuers of ARTs can invest part of the reserves “in highly liquid financial instruments” with minimal market and credit risk. The investments shall be capable of being liquidated rapidly with minimal adverse price effect”.¹⁶¹ This clearly seeks to make the EU palatable to the issuers of stablecoins. Such issuers are allowed to perform both maturity, credit, and liquidity transformation, moving away from the model of narrow banking and getting dangerously close to the business model of traditional banks while being subject

contrast, different valuation techniques can bring about severe consequences, as discussed for Money Market Funds (see text to note n. 89). On the other side, the amended formulation stresses the entitlements of ART holders to the “face value” of their claim, which is equivalent to promising safety and liquidity. The final version of MiCA addressed this issue by referring to MMF valuation regulation, as detailed later in this section.

¹⁵⁶ Article 32(3) MiCA.

¹⁵⁷ Article 32(4) MiCA.

¹⁵⁸ Article 32(5a) and (5b) MiCA

¹⁵⁹ See above, text to note 93.

¹⁶⁰ See the discussion on procyclicality above, text to note 26.

¹⁶¹ Article 34(1) MiCA.

only to a fraction of the prudential safeguards of banks, including the lack of access to central banks liquidity facility and deposit guarantee.¹⁶²

One may argue that these concerns are, at least partly, unwarranted since the regulation only allows the issuer to invest in highly liquid financial instruments. The discussion on the procyclicality of liquidity and legal entitlements helps in quickly dismissing this counterargument. The categorisation of an asset, or asset class, as highly liquid entails a fair degree of discretion. The Global Financial Crisis offers several instructive examples. Suffice it to say that in the period leading up to the 2008 crash, the senior tranche of Mortgage-Backed Securities was often rated AAA and was considered highly liquid. More generally, several assets can be regarded as liquid in the upward portion of a credit cycle, but as soon as the cycle reverses, liquidity dries up and the accumulated risk materialises.

Therefore, beyond the general statement of the primary regulation, the regulatory technical standards will play a key role in striking a balance between the safeguard of financial stability and the goal of promoting regulatory competition defining the asset classes that are considered highly liquid.

Based on a draft by the European Banking Authority,¹⁶³ in delegating this power to the Commission, the regulation sets few requirements. The RTS should take into account the type of reserves that can back ARTs and their correlation with the assets that the issuer can invest in. In drafting the RTS, the regulation provides a benchmark, which is the regime applicable to banks when calculating liquidity requirements and, in particular, High-Quality Liquid Assets (HQLA).¹⁶⁴ The assets that are considered highly liquid are split into Level 1 (“assets of extremely high liquidity and credit quality”)¹⁶⁵ and Level 2 (“assets of high liquidity and credit quality”).¹⁶⁶ The Commission has a degree of discretion, but the wording of the regulation suggests that issuers of ARTs will also be allowed to invest in Level 2. These include, for instance, covered bonds issued by financial institutions, highly rated debt securities, but also asset-backed securities, listed shares, and so forth.¹⁶⁷

¹⁶² The final version goes in the right direction, requiring ESMA to include the percentage reserves whose maturity shall be daily or weekly (Article 34(4)(ca) and (cb) Amended MiCA). This partially re-aligns MiCA with the MMF Regulation, even though the supervisor, ESMA in this case, retains considerable discretion.

¹⁶³ ESMA in the Amended MiCA.

¹⁶⁴ See Article 412, Regulation (EU) No 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No 648/2012 (hereinafter: Capital Requirement Regulation) and Commission Delegated Regulation (EU) 2015/61 of 10 October 2014 to supplement Regulation (EU) No 575/2013 of the European Parliament and the Council with regard to liquidity coverage requirement for Credit Institutions.

¹⁶⁵ Article 3(1) Delegated Regulation. For instance, government debt.

¹⁶⁶ Article 3(2) Delegated Regulation.

¹⁶⁷ Article 11 and 12 Delegated Regulation.

Therefore, the picture becomes much more complex and nuanced when looking at the details of what is considered highly liquid.

The final version of MiCA tries to partly cover these risks introducing liquidity requirements on reserve assets. Specifically, the EBA in cooperation with ESMA and ECB, shall develop regulatory technical standards specifying the percentage of assets maturing daily and weekly as well as the minimum amount of each official currency referred by the tokens to be held, which cannot be inferior to 30% of reserves.¹⁶⁸ This provision brings ART closer to MMF shares hence must be welcome. However, the effectiveness of these requirements is in the hands of the EBA, whereas it would have been more appropriate to regulate this aspect directly in primary legislation. Moreover, the floor on official referenced currency to be held is also a welcome addition, but also shows how relevant is the maturity and liquidity transformation that ART issuers can engage in.

The issuer of ARTs also has the duty to hold the reserves in custody, segregated from its own assets.¹⁶⁹ This does not directly impact the liquidity risk profile of an ART but has important implications both in terms of investor protection and financial stability.¹⁷⁰

The aspect that directly relates to liquidity risk and liquidity mismatch is that the reserves held in custody cannot be encumbered or pledged. This provision limits the issuer's flexibility and protects investors and financial stability in an attempt to prevent the issuer's most abusive behaviours. However, there is no specific prohibition on engaging in securities lending so long as the issuer has prompt access to the reserves and the securities lent are, in turn, held in custody.¹⁷¹

5.1.3 The Regulation of Liability Side

Discussing the regulation of the 'asset side' of ART, the final version of MiCA made relevant progress compared to the original proposal, bringing issuers' obligation closer to those of MMFs. However, the overall appraisal of the regulation does not change much, since the 'improvements' on the asset side are a way to rebalance the provisions governing the liability side.

On the liability side, there are two key elements: the rights of the token holders, especially when it comes to withdrawal rights, and the own funds requirements. Functionally, the rights of the holders are crucial from a financial stability

¹⁶⁸ Article 32(1d) MiCA.

¹⁶⁹ Article 33 MiCA.

¹⁷⁰ See H. Nabilou, "The Law and Macroeconomics of Custody and Asset Segregation Rules: Defining the Perimeters of Crypto-Banking" (Amsterdam Center for Law & Economics Working Paper No. 2022-03, 2022) at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4070708 (last visited 30.08.2022).

¹⁷¹ On the liquidity risk inherent in securities lending, see Adrian et al., n 107 above.

perspective as they directly impact the possibility of running. The possibility of running on short-term debt is a direct function of the legal arrangements governing such instruments.

The regulation is decisively geared toward creating a flexible environment for the issuers of ARTs and protecting investors, whereas the financial stability considerations are limited, and the regulation establishes a “general right to liquidity” for token holders, i.e., a general right to realise the value of the tokens at any time. Even more so in the final version of MiCA, where investors are entitled with strong and rigid rights to liquidity.¹⁷² This construction relies on the underlying and misleading assumption that liquidity is a free good.

Issuers must at all times grant redemption rights. To guarantee liquidity, each issuer should establish, maintain, and implement a policy on the rights granted to the holders.¹⁷³ The policy must detail the conditions to exercise such a right and the mechanism to ensure that redemption is possible even in stressed market circumstances. The policy should also describe the principles of valuation for the redemption price and the fees applied. Notably and in contrast to the previous version of MiCA, no fees can be charged to investors for redemption. This provision clearly looks at strengthening the position of token holders in good times. However, prohibiting redemption fees may have unintended consequences as it reduces the net operating margin of ART issuers. From their perspective, the only way to keep the margin constant is to increase the return on their assets, which means holding reserves and investing in assets that guarantee a higher return. Thus, this is likely to increase the willingness of issuers to engage in liquidity and maturity transformation in good times.

To shield issuers of ARTs and the financial system from the risks inherent in stablecoins, the regulation imposes own funds requirements. The issuers of asset referenced tokens shall, at all times, have own funds equal to at least 2% of the

¹⁷² On the desirability of strong and absolute rights from a liquidity risk perspective, see *supra* text to note 44.

¹⁷³ Article 35(1) MiCA. In the original proposal this right to liquidity was less rigid. Issuers could choose how to provide liquidity through their own policy. Such policy should have should detailed the rights granted to the token holders whereby the “right to liquidity” can be provided following two different models – first, providing a direct withdrawal right to all token holders, granting them a right on the reserve assets; second, limiting the withdrawal rights to few institutional investors and setting up policies and procedures to assure that liquidity is provided to token holders through crypto exchanges. Moreover, the original proposal provided for an absolute right of withdrawal only if the price of ARTs “varies significantly” from the reference asset, each token holder shall have the right to withdraw directly. That could already be understood as a ‘right to run’ that, however, kicked in only at a late stage. With the new formulation, the ‘right to run’ is embedded in the regulatory design at all times.

average amount of reserves calculated over the previous 6 months.¹⁷⁴ It should be noted that in case of a sudden and sizeable inflow of funds, issuers can become severely undercapitalised while still fully complying with the regulation.

The competent authority of each Member State can increase or decrease the amount of required own funds by up to 20%.¹⁷⁵ For what is of interest here, in taking this decision, the competent authority should take into account the quality and volatility of the reserves, the type of rights granted to owners, and the risk of the investment policy pursued when investing the reserves. This norm confirms that the European policymaker is aware that the issuer can engage in activities that are dangerous for financial stability and, on the other hand, entrust the competent authority to cope with such risk by increasing the own funds requirements. While this goes in the right direction, it is doubtful that this is nearly enough to prevent a run in case of a liquidity shock.

More generally, one may question whether the requirement to hold a relatively small amount of capital is a useful tool to cope with the key risk factor of stablecoins, i.e., abrupt and sudden liquidity crises. Interestingly, the current MMF Regulation focuses entirely on liquidity requirements and early crisis management tools without mandating legal capital.

5.1.5 Recovery of ARTs Issuers

The final version of the MiCA regulation appropriately included the requirement for issuers of ART to draw up and maintain a ‘living will’, which is a plan with pre-arranged state contingent measures in case of a sudden deterioration of the issuers’ financial condition.

Crucially, the plan must “include appropriate conditions and procedures to ensure the timely implementation of recovery actions as well as a wide range of recovery options”. Among such recovery option, the regulation includes (1) the imposition of liquidity fee on redemption; (2) a cap on maximum day redemption; (3) the possibility to suspend redemption.¹⁷⁶ Those measures mirror the MMF Regulation and are apt to stop a run if it materialises.¹⁷⁷

¹⁷⁴ Only instruments with the characteristic provided by the Capital Requirement Regulation for Common Equity Tier 1 in Articles 26-29 can count as own funds for the purpose of this regulation.

¹⁷⁵ In the Amended MiCA, the 20% buffer is calibrated by the competent authority based on the outcome of stress tests, making it functionally similar to the current Pillar 2 Guidance issued by the supervisor for European banks.

¹⁷⁶ Article 41a(1) MiCA.

¹⁷⁷ For a theoretical model, see R. Matta, E. Perotti, “Pay, Stay or Delay? How to Settle a Run” (2021). Available at SSRN: <https://ssrn.com/abstract=3487535> or <http://dx.doi.org/10.2139/ssrn.3487535>

While this additional requirement is in principle welcome, the design of norm may likely make it ineffective. First of all, looking at the linguistic formulation of the rule, it is unclear whether the three measures listed above must be part of the recovery plan or if it is simply a possibility. Second, the competent authority has the power only to require the changes necessary for a timely implementation of the plan, whereas it appears to have no say on the substantive elements of the plan.¹⁷⁸

This becomes possible only when the issuer fails to comply with the requirements on reserve assets or it is likely to fail in the near future. In these cases, the competent authority can require substantive changes in the recovery plan or directly require the issuer to implement the plan.¹⁷⁹ In these circumstances, the Competent Authority has also the power to temporarily suspend the redemption of ART.¹⁸⁰

This regulatory design clearly aims at rebalancing the strong and rigid entitlements provided to ART issuers in terms of withdrawal right. However, in doing so, it lacks a clear and incisive preventive approach. The measures provided by the ‘recovery plan’, which is drafted privately by the ART issuer may well be insufficient, the implementation of the plan is likely to be delayed and the approach of the supervisor is prone to forbearance.¹⁸¹

5.1.4 The Regulation of Significant Issuers

So far, the regime for Asset Referenced Tokens clearly prioritises investor protection and the will to create a conducive regulatory environment for prospective issuers, with some minor adjustments for financial stability. The last body of rules on “significant” issuers of asset referenced tokens aims exclusively at adjusting the regulatory regime for financial stability.¹⁸² Specifically, the issuers of significant asset referenced tokens shall adopt remuneration and liquidity management policies and hold 3% of own funds. Moreover, issuers of significant ARTs must establish, maintain and implement both a remuneration and a liquidity management policy.¹⁸³

Moreover, and most importantly, issuers of significant ARTs must hold at least 60% of the referenced currencies, compared to the 30% imposed on non-significant

¹⁷⁸ Article 41a(2) MiCA.

¹⁷⁹ Article 41a(3) MiCA.

¹⁸⁰ Article 41a(4) MiCA.

¹⁸¹ For a theoretical model of forbearance and run risk, see N. Martynova, E. Perotti and J. Suarez. "Capital forbearance in the bank recovery and resolution game." (2022) 146(3) *Journal of Financial Economics*, 884.

¹⁸² The exact definition of significant ART issuers is demanded by a delegated act by the EU Commission. The regulation states that no ART issuer whose capitalisation is below 1 billion € should be considered significant. Articles 39 and 40 disciplines the rules and procedures for the identification or voluntary classification of significant ARTs.

¹⁸³ See, respectively, Article 41(1) and 41(3) MiCA.

ARTs.¹⁸⁴ This curbs the possibility to engage in maturity and liquidity transformation. However, significant ART-issuer can still invest reserves according to Article 35.

The enhanced regulatory scrutiny on significant asset referenced tokens is mirrored by enhanced regulatory scrutiny for those issuers. From this perspective, the final version of MiCA made significant steps in the right direction. Issuers of significant ARTs are now required to conduct liquidity stress-tests on a regular basis, communicate their result to the EBA which – based on the result of the stress test – can decide to strengthen the liquidity requirements.¹⁸⁵

The supervision of significant asset referenced tokens is not delegated to national competent authorities but is centralised and entrusted to the European Banking Authority (EBA). At first glance, this choice appears peculiar as the EBA has not acted as a supervisory authority so far; rather, it mainly acts as a regulatory agency for the banking industry.¹⁸⁶

This designation seems to primarily look at a politically acceptable distribution of powers among different European agencies and institutions. Such compromise is likely to have implications in terms of the quality and rigorousness of supervision, given the EBA's lack of experience and human capital.

These concerns are reinforced if one goes and scrutinises the actual supervisory powers allocated to the EBA. Beyond the standard powers to request information and carry out investigations and on-site inspections, the EBA lack any significant power of prompt corrective action and the measures that it can take are mild and merely reactive to regulatory breaches.¹⁸⁷

5.2 The Regulation of Stablecoins: eMoney Tokens

EMoney Tokens (eMTs) are crypto-assets that purport to maintain a stable value by referring to the value of a fiat currency that is legal tender. Their discipline closely

¹⁸⁴ Article 41(6)(aa) MiCA.

¹⁸⁵ Article 41(3a) MiCA.

¹⁸⁶ In the amended version of MiCA proposed by the European Parliament, the competence was shifted to ESMA, but such a shift in supervisory powers was not confirmed in the final version of the Regulation.

¹⁸⁷ On the relevance of prompt corrective actions in banking supervision, see X. Freixas and B Parigi, “Banking regulation and prompt corrective action”, (21st Australasian Finance and Banking Conference, 2008), at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1153447 (last visited 30.08.2022).

resembles the one for eMoney Institutions.¹⁸⁸ The discussion on eMoney Tokens (eMTs) can be considerably shorter than that on ARTs for three main reasons. First, this form of stablecoins is likely to be used in limited circumstances and only in relation to other, established, financial services similar to what is happening with eMoney. Second, and relatedly, it is likely to focus on stablecoins as an alternative means of payment. As discussed in Section 4.2, this seems to be a recessive trend in the industry, and, in any case, it generates less concern in terms of liquidity risk.

The key differences between eMTs and ARTs are that eMTs can be referred to only as a fiat currency that is legal tender and, even more importantly, that direct redemption rights at par must always be guaranteed to all token holders. On the other hand, issuers have much less flexibility in the quality and investment of reserve assets.

The obligations on the issuers of eMoney Tokens are, by and large, the same as those imposed on the issuers of eMoney. On top of those, for significant issuers, the requirement of having in place a liquidity management policy applies. Again, the own funds requirement is 3% for significant issuers and 2% for all other issuers. Also, the requirement to segregate reserves from the issuer's assets and the prohibition to encumber reserves apply.

This configures a business model that is fairly similar to a narrow bank, where the policy priorities are protecting investors and safeguarding financial stability.

6. Conclusion

The article showed that stablecoins are a new way of generating “private money” relying on the combination of “old” legal techniques and the “new” distributed ledger technology. This implies that many regulatory lessons have already been learnt over time, in particular in terms of liquidity risk that private money brings about.

Such liquidity risk is largely a function of the applicable legal framework and the type of rights entrusted to the users of private money. In turn, the regulation of private money entails trade-offs between partly divergent policy goals: financial stability, investor protection, and regulatory competition (promoting innovation), whereby policymakers cannot achieve all of these simultaneously.

This applies, for instance, to the shares of money market funds that are functionally similar to stablecoins using a physical reference stabilisation mechanism. Thus, looking at the developments of the regulatory regime of these funds proved

¹⁸⁸ Directive 2009/110/EC of the European Parliament and of the Council of 16 September 2009 on the taking up, pursuit and prudential supervision of the business of electronic money institutions amending Directives 2005/60/EC and 2006/48/EC and repealing Directive 2000/46/EC.

particularly instructive in understanding how the law can exacerbate liquidity risk in stressed scenarios and how the post-crisis reform of MMFs provides a suitable blueprint for the regulation of stablecoins.

Against this backdrop, the final version of the EU Regulation revealed several shortfalls as it does not take liquidity risk into account, especially for Asset Referenced Tokens. The analysis shows that it prioritises investor protection and regulatory competition at the expense of financial stability, despite claiming to achieve all the goals. The final iteration of the Market in Crypto Asset Regulation, approved by the European Council on October 5th 2022, makes some steps in the right direction compared to the original proposal by the European Commission. However, those steps are counterbalanced by stronger and more rigid rights of withdrawal entrusted to token holders.

If this kind of regulatory approach is confirmed and shared also by other jurisdictions, stablecoins may become a serious source of vulnerability for financial stability in the coming years.