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ARTICLE

How Should Crypto Lending Be Regulated Under EU Law?

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Abstract

The collapse of Genesis is the latest in a cascade of failures of crypto lenders. The last year has seen numerous major crypto lenders, such as Celsius, Voyager and BlockFi, going out of business in domino-like fashion. The failures have revealed the vulnerabilities of crypto-market lenders' business model, most notably the liquidity and maturity mismatches in their loan portfolios, and their markedly weak corporate governance. The present article explores avenues to regulate crypto lending within the framework of EU financial services regulation. It argues that crypto lenders should be taken as falling within the definition of credit institutions under EU law, and thus, as a result, should be subject to the stringent licensing and prudential requirements introduced by the Capital Requirements Directive and Regulation. Prudential regulation is one of the ways that have been suggested for the regulation of crypto-market operators, alongside the investor protection framework. Taking into account that crypto lenders easily operate on a cross-border basis and that prudential regulation is fully harmonized in the EU, we take an EU-wide perspective and focus our analysis on EU law, rather than member state laws. In addition, prudential regulation can deal with any systemic risk issues with which investor protection regulation cannot deal. However, in order to avoid moral hazard and not give investors the false impression that crypto lenders are safe too-big-to fail institutions, we suggest that crypto lenders should not enjoy the full protection of prudential regulations. In particular, they should not be offered lender of last resort support and they should not be allowed to subscribe into a deposit insurance scheme. Even though it is often said that crypto markets pose no risk to the regulated sector due to limited interconnectedness, it should be noted that due to the high leverage of crypto investors, the real risk to the regulated sector comes from the possibility of crypto investors massively liquidating their positions in other asset markets.

Keywords Crypto lending · Prudential regulation · Financial stability · EU law · DeFi · Fintech · Crypto assets

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1 Introduction

One of the biggest challenges facing policymakers with respect to crypto markets is the treatment of crypto lending. ECB President Lagarde recently stated that crypto lending should be regulated.[1] According to the ECB President, the growing incidences of fraud, criminal dealings and dubious valuation practices in the crypto-lending space pose severe risks to consumers. One question flowing from her statement is: how should crypto lending be regulated? The present article will explore avenues to regulate crypto lending within the framework of EU financial services regulation. It will argue that crypto lenders fall within the definition of credit institutions under EU law. As a result, they should be subject to the stringent licensing and prudential requirements provided by the Capital Requirements Directive and Regulation. It should be noted that crypto lenders are predominantly operating in the US, with their presence in Europe still limited. However, the considerable growth of crypto lending in Europe may lead crypto-lending firms to expand their operations in Europe, thus necessitating a regulatory response from European policymakers. A similar pattern could be observed with regard to the regulation of credit rating agencies. The Big Three credit rating agencies were all based in the US. Nevertheless, their expansion in Europe and their role in aggravating and/or causing the financial and sovereign debt crisis forced European policymakers to adopt a comprehensive regulatory and supervisory framework.[2]

The last few years have seen the exponential growth of crypto lending, with lenders such as Celsius, BlockFi and DeFi protocols, such as MakerDAO and Compound, dominating the space.[3] Nonetheless, the failure of Celsius Network and Voyager has alarmed policymakers to the importance of crypto lenders for crypto markets and the fragility of their business model. Moreover, the spectacular collapse of FTX created contagion across the industry and had a spillover effect on crypto lenders, with major firms such as Genesis and BlockFi suspending withdrawals of customer funds and filing for bankruptcy.[4] As the present article will argue, the activities of crypto lenders, which involve the taking of deposits in crypto assets and the granting of crypto loans, resemble banking activities. However, lack of regulation creates a competitive advantage for crypto lenders vis-à-vis licensed banks. Unregulated crypto lenders are able to produce returns by taking on excessive risk. Furthermore, as the recent Celsius debacle demonstrates, the procyclical nature of

[1] Beganski (2022); Hetzner (2022).

[2] The overdependence of investors on credit ratings and the flawed business model of credit rating agencies fueled the subprime mortgage bubble and are considered to be among the causes of the financial crisis. See generally Partnoy (2017). For the shortcomings of the credit rating agency industry, which contributed to the Eurozone debt crisis, see Gaillard 2013. In the aftermath of the financial crisis the EU adopted the so-called CRA Regulation, which provided for the mandatory registration and supervision of credit rating agencies. The Regulation was amended in 2011 and 2013. For an overview of regulatory reform both in Europe and the US, see generally Coffee Jr (2010).

[3] Shimron (2020).

[4] Fletcher and Oliver (2022); Findlay et al. (2023). More than $900 million in customer funds remain frozen in Genesis's bankruptcy. See Sweet (2023).

crypto-lending activities, fire sales of investor holdings in other asset classes, high leverage employed, and the risk of depositor runs may give rise to systemic risk.[5] Prudential regulation will make crypto-lending institutions safer and more stable. For example, prudential regulation would have prevented crypto lenders' exposure to a single asset class and would have cured their vulnerability to liquidity risks (e.g., user runs). It would also have limited the ability of crypto lenders to be highly leveraged. In this way crypto lenders would have become more stable and resilient, and the string of recent failures would have been averted. It is plausible to argue that if crypto lenders were subject to prudential regulation, recent crypto-lender failures and attendant investor losses[6] would have been prevented, e.g., in the US only banks and similar regulated depositary institutions are allowed to take deposits.[7]

Unregulated crypto lenders have not been subject to any conduct of business or other rules for the protection of investors or users, making it easy for crypto lenders to misrepresent their status and conceal the risks of their products from market users. The present article will treat crypto lending as an activity distinct from other crypto-asset market activities, such as crypto-currency trading or taking custody of crypto assets, which are activities dealt with by the draft EU Regulation on Markets in Crypto-Assets, also known as 'MiCA'.[8]

2 DeFi and Crypto Lending

2.1 DeFi

The combination of blockchain technology and smart contracts has given rise to a new financial ecosystem known as decentralized finance or DeFi.[9] The total value

[5] Ponnezhath and Wilson (2022). See also IMF (2021).

[6] Inductively, the total of investor losses in the Celsius saga was in the vicinity of $4.7 billion. This sum shows how important it is to protect investors and markets from the egregious practices of crypto lenders. Sigalos (2022).

[7] Alexander et al. (2014). See 26 U.S.C Sect. 581. The term 'bank' means a bank or trust company incorporated and doing business under the laws of the United States or of any State, a substantial part of the business of which consists of receiving deposits and making loans and discounts, or of exercising fiduciary powers similar to those permitted to national banks under authority of the Comptroller of the Currency, and which is subject by law to supervision and examination by State or Federal authority having supervision over banking institutions.

[8] MiCA introduces a regulatory framework for the issuance and trading of crypto assets. It covers crypto assets that are not classified as financial instruments under MiFID II, such as utility tokens and stablecoins. Furthermore, MiCA introduces rules for crypto-asset service providers, which are required to be authorized in order to operate within the EU. Council of the EU (2022).

[9] The Ethereum platform is the most popular choice for DeFi financial services and products. The Ethereum blockchain allows the design and employment of highly programmable smart contracts with automated execution. Buterin defined smart contracts as systems which automatically move digital assets according to arbitrary pre-specified rules. See Buterin (2014), p 1. Moreover, Ethereum's composable software stack ensures that DeFi applications (dapps) are built to integrate and complement one another. See Avgouleas and Seretakis (2022), p 17.

locked in DeFi reached an all-time high of $253 billion in December 2021.[10] DeFi is a term used to describe an ecosystem comprising financial applications built on top of blockchain networks which do not rely on traditional financial intermediaries such as brokerages, exchanges, or banks.[11] DeFi aims at replicating existing financial services without the involvement of centralized intermediaries.[12] In a DeFi environment the users can maintain full control over their assets and interact with this ecosystem through peer-to-peer (P2P), decentralized applications (dapps). DeFi applications do not need any intermediaries or arbitrators. Pre-set software code specifies the resolution of disputes that can be predicted in advance. Essentially, the Code is law among users and thus, in the context of blockchain platforms, it has been given the name 'Lex Cryptographia'.[13]

Among the alleged advantages of DeFi is the bypassing of rent-seeking intermediaries in financial services and the cultivation of an environment where technological innovation can thrive and offer more consumer choice when it comes to payments and lower transaction costs. According to DeFi proponents, the removal of centralized intermediaries will lead to a more open, transparent and resilient financial ecosystem.[14] DeFi infrastructures provide flexibility and transparency in contract design as well as a high level of record security. DeFi platforms enable the creation of new financial instruments and digital assets by allowing developers to build on top of existing protocols, customize interfaces, and integrate third-party applications. As a result, they are often compared with lego pieces and referred to as money legos.

DeFi operations include decentralized exchanges, decentralized derivatives, insurance, asset management and crypto lending. Decentralized exchanges allow the trading of digital assets without taking custody of user assets, which allows users to re-deploy their assets in other investment activities.[15] Decentralized derivatives are tokens that derive their value from an underlying asset or the outcome of an event.[16] DeFi insurance services are mostly used for insuring against the risks posed by smart contract failures and hacks of DeFi protocols.[17] Claims are paid out with digital assets after the vote of claim assessors. As far as asset management is concerned, DeFi investment funds invest in crypto assets, which are locked up in a smart contract.[18] The lending market is another fast-growing sector of the DeFi ecosystem. DeFi seeks to bypass the traditional intermediaries in borrowing and lending, most notably banks. DeFi lending and borrowing are governed by smart contracts, and

[10] Minter (2021). The collapse of the crypto market severely impacted the DeFi sector, with the sector partly recovering during the summer of 2022.

[11] Avgouleas and Seretakis (2022), p 13.

[12] Ibid., at pp 16–17.

[13] See generally De Filippi and Wright (2018) and Dimitropoulos (2020).

[14] Schar (2021).

[15] The largest decentralized exchange is Uniswap, whose total trading volume exceeds $1 trillion. Quarmby (2022).

[16] Wharton Blockchain and Digital Asset Project (2021), p 14.

[17] Ibid., p 15.

[18] Ibid., p 16.

loans are often overcollateralized, with borrowers depositing collateral in crypto coins.

It should be noted that DeFi creates major challenges, especially relating to fraud and market instability and volatility. Indeed, crypto lending has been identified as a potential source of risk to the financial system. Also, crypto markets have recently been implicated in alleged money-laundering schemes and efforts to bypass recent Western sanctions on Russia.[19]

2.2 The Nature of DeFi Markets

According to the IMF, the tremendous growth and expansion of crypto markets presents risks for financial stability.[20] The recent turbulence in crypto markets, including DeFi markets, has exposed structural vulnerabilities in the ecosystem. In particular, the mayhem in crypto markets has exposed crypto assets' volatility, with the crypto market witnessing wild price swings.[21] Crypto assets exhibit extreme fluctuations which are greater than those of other financial assets.[22] Moreover, despite claims to the contrary, the correlation between the changes in the price of crypto assets and riskier assets, such as equities, has been increasing over the past few years.[23] Another major source of vulnerability is the ability of investors to establish highly leveraged positions, which exacerbate procyclicality and volatility and create, like other forms of shadow banking,[24] invisible links of interconnectedness. Dapps, such as trading and lending platforms, facilitate the build-up of leveraged positions. For instance, the maximum permitted margin in decentralized exchanges is higher than in regulated exchanges. Moreover, collateralized lending allows the recycling of collateral, enabling investors to build large exposures using the same crypto assets. Leveraged positions are the first to be unwound when there is downward price pressure in crypto markets. Finally, the pseudonymous nature of the DeFi ecosystem and crypto markets more in general may facilitate money laundering, terrorist financing and market manipulation. Furthermore, regulators are unable to have a complete view of the market and monitor financial stability risks.[25] What is more, as the Bank of International Settlements notes, anonymity and dependence on collateral undermine DeFi's goal to promote financial inclusion.[26] Especially in the context of DeFi lending, reliance on collateral benefits the owners of assets.

[19] Flitter and Yaffe-Bellany (2022).

[20] IMF (2021), p 39.

[21] Brainard (2022), p 2.

[22] de Hernandez (2022), pp 4–5.

[23] Ibid.

[24] Arguably, the best way to approach crypto lending is as a form of shadow banking. It should be noted that a run on collateral in the shadow banking sector was held to be one of the main causes of the global financial crisis. See the classic paper by Gorton and Metrick (2012). Other scholars also understand decentralized finance (DeFi) as a form of shadow banking, see, e.g., Allen (2022).

[25] Drakopoulos (2021).

[26] Aramonte et al. (2022), p 2.

Most of today's DeFi activity is outside the regulatory perimeter, but this is a situation that is no longer tenable. Thus, the European Commission has recently proposed a digital finance package aimed at fostering Europe's competitiveness and innovation in the financial sector. The package includes a Digital Finance Strategy, a Retail Payments Strategy, and legislative proposals on crypto assets and digital operational resilience and a plot regime for market infrastructures powered by distributed ledger technology. But the Digital Package that is still under consideration is only the beginning. EU financial services regulation will soon require a wholesale overhaul in order to keep pace with the digital transformation of the financial value chain both within the EU and globally.

2.3 The Particular Case of Crypto Lending

The sudden collapse of Celsius and Voyager has turned the attention of policymakers to the fragility of the business model of crypto lenders and their contribution to systemic risk. Crypto lenders, such as Celsius and Voyager, sought to provide a solution to two distinct problems facing crypto holders: lack of liquidity and lack of market purchasing power.[27] Crypto holders face a liquidity problem since crypto currencies are not widely accepted as a medium of exchange. As a result, holders of crypto who want to monetize their holdings can convert them into fiat currency.[28] Moreover, it offers them the opportunity to earn handsome returns on their crypto holdings, through staking, which is only available to holders of big portfolios.[29] Specific crypto lenders engage in secured lending, which allows holders to deposit their assets and borrow fiat currency or other digital assets using their crypto holdings as collateral.

Furthermore, users can also earn rewards on these assets at rates that are more favorable than those offered by traditional intermediaries or other crypto platforms. Crypto lenders are in essence performing credit intermediation outside the regular banking system. As a result, they should be understood as a form of shadow banking. For example, Adrian and Ashcraft define shadow banking as 'a web of specialized financial institutions that channel funding from savers to investors through a range of securitization and secured funding techniques',[30] while the Financial Stability Board defines it as 'credit intermediation involving entities and activities outside the regular banking system'.[31]

It should be noted that Celsius was one of the biggest crypto platforms in the world. Headquartered in New Jersey, USA, Celsius had, in May 2022, around $12 billion of assets under management and had issued loans in excess of $8 billion. According to its chief executive Alex Mashinsky, the Celsius business model was

[27] In re: CELSIUS NETWORK LLC, et al., Declaration of Alex Mashinsky, Chief Executive Officer of Celsius Network LLC, in Support of Chap. 11 Petitions and First Day Motions, p 2.
[28] Ibid.
[29] Ibid.
[30] Tobias and Ashcraft (2012).
[31] FSB (2011).

centered on deploying digital assets to generate income for Celsius' operations and growth.[32] Celsius offered the so-called 'Earn' program that enabled users to deposit their digital assets with Celsius, which was then allowed to use these assets in order to generate yield. Users earned rewards on their assets in the form of payment in kind interest or Celsius tokens, with the annual percentage yield reaching 17% on certain assets.[33] The company generated the yield through various activities, including lending services, and also provided borrowing services to retail and institutional clients. Furthermore, the company had extended loans to its clients secured by digital assets, which it was allowed to rehypothecate.[34] Moreover, it engaged in staking and deployed digital assets into automated market maker or lending protocols, for a fee.[35] Losses suffered on certain illiquid investments and the collapse of the crypto market led to massive withdrawals by depositors, destabilizing the company, which was forced to impose a ban on withdrawals to stem the depositor run.

Voyager was the next major crypto lender to file for bankruptcy following the turbulence in the crypto market and the default of one of its borrowers.[36] Voyager operated a crypto-currency platform that enabled its users to trade and store crypto currency. Customers were able to deposit their crypto holdings and earn interest on them.[37] Voyager was able to pay interest on deposits by lending crypto currency deposited on its platform to third parties at a pre-negotiated interest rate. The widespread panic in crypto-currency markets, the announcement by Celsius Network that it was suspending all account withdrawals and transfers and the collapse of Three Arrows, a crypto fund,[38] which had borrowed more than $670 million, led to a run by Voyager's customers.[39] The company was forced to suspend withdrawals and trading activity on its platform and file for bankruptcy.

Finally, crypto lenders were severely hit by the sudden collapse of crypto exchange FTX. The FTX empire, founded by fallen crypto mogul Sam Bankman-Fried, included the FTX crypto exchange and Alameda Research, a quantitative crypto hedge fund speculating in digital assets.[40] Following the announcement of Binance, a rival exchange, that it would liquidate its holdings in FTT, FTX's native token, FTX suffered an effective run on the bank, with customers' withdrawal requests amounting to an estimated $6 billion over 3 years.[41] FTX, which was using

[32] In re: CELSIUS NETWORK LLC, et al., Declaration of Alex Mashinsky, Chief Executive Officer of Celsius Network LLC, in Support of Chap. 11 Petitions and First Day Motions, p 5.

[33] Ibid.

[34] Ibid.

[35] Ibid., pp 22–23.

[36] Oliver (2022).

[37] In re: VOYAGER DIGITAL HOLDINGS INC., Declaration of Stephen Ehrlich Chief Executive Office of the Debtors, in Support of Chap. 11 Petitions and First Day Motion, pp 11–12.

[38] Singapore-based Three Arrows was one of the best known crypto hedge funds, making large leveraged bets on rising crypto prices. The collapse of crypto token Luna inflicted heavy losses on Three Arrows, which had made significant investments in the token. Chipolina and Samson (2022).

[39] In re: VOYAGER DIGITAL HOLDINGS INC., Declaration of Stephen Ehrlich Chief Executive Office of the Debtors, in Support of Chap. 11 Petitions and First Day Motion, pp 12–24.

[40] Oliver et al. (2022).

[41] Huang (2022).

customer funds in order to finance the risky and illiquid bets by its affiliated trading firm Alameda Research, was unable to fulfil the requests.[42] The resulting liquidity crunch forced FTX to file for bankruptcy. The bankruptcy proceedings have revealed aggressive risk-taking, an utter lack of corporate controls and risk management, absence of transparency and trustworthy financial information, and self-dealing.[43] In particular, the case exposed the poor corporate governance standards and lack of accountability permeating the crypto industry. Headquartered in Nassau, the Bahamas, FTX had a three-person board, including its founder Sam Bankman-Fried and a lawyer in Antigua.[44] Indeed, some companies of the FTX Group never even held a board meeting. FTX's collapse had a wider impact, leading to widespread contagion in crypto markets and a market-wide run on crypto lenders, which were forced to halt redemptions and loan originations.[45] Crypto lenders' difficulties revealed the inherent vulnerability of their business model caused by the liquidity and duration mismatch of their loan portfolio.

3 Crypto Lending: Risks and Regulatory Response

3.1 What Are the Risks?

The key financial stability threat of crypto lending comes from the excessive volatility of crypto-currency markets and the fact that lots of crypto assets, such as non-fungible tokens (NFTs),[46] are very complex and very difficult to value, making it very difficult to obtain adequate collateral to secure the loan.[47] So, as a result, user leverage within the system remains uncontrolled. This practice exposes crypto lenders to suspicions and rumors about their financial health, thus causing market panic, manifested as depositor runs, which expose the well-concealed liquidity imbalances within crypto lenders, leading crypto lenders and crypto-exchange platforms to face the risk of illiquidity. An indicative example is the FTX debacle where market confidence in FTX evaporated shortly after the release of a report by crypto-currency news platform CoinDesk, which on this occasion revealed the close ties between

[42] Michaels et al. (2022).

[43] John Ray, the new chief executive and chief restructuring officer of FTX, stated: 'Never in my career have I seen such a complete failure of corporate controls and such a complete absence of trustworthy financial information as occurred here.' See In re: FTX TRADING LTD et al., Debtors, Declaration of John J. Ray III in Support of Chap. 11 Petitions and First Day Pleadings, p 2. According to bankruptcy lawyers, Sam Bankman-Fried ran FTX as a personal fiefdom with a substantial amount of money being used to buy vacation homes in the Bahamas. Kinder (2022).

[44] CBS News (2022).

[45] Sigalos and Capoot (2022).

[46] According to Makavor and Schoar (2022), p 26, NFTs are 'a unique piece of data stored on a blockchain. The data can be associated with a particular digital or physical asset or a license to use the asset for a specified purpose.'

[47] Collateral made up of crypto assets can be very volatile and can quickly lose value. For instance, Sam Bankman-Fried argued in a letter to staff that the value of collateral held by FTX dropped from $60 billion to $9 billion. De (2022).

Alameda and FTX.[48] In this way, instability can spread to other institutions or market segments (contagion), resulting in a generalized confidence crisis.[49] Even though the interconnectedness between crypto lenders and mainstream financial institutions is limited, a market panic, including a flight to save assets, is a behavioral phenomenon and is very hard to contain ex ante.[50] A valid concern here is whether investor runs from the crypto markets can evolve into a generalized confidence crisis, despite the fact that the links between crypto lenders and regulated financial institutions appear to be limited.

Moreover, the number of retail investors with exposures to crypto-currency markets is ever increasing. The proportion of Bitcoin supply held by retail investors has reached an all-time high at 17%.[51] The volatility of crypto currencies and crypto markets, and their boom and bust cycles, can leave investors exposed to significant losses and amplify market instability through the aforementioned collateral channel. For example, a recent paper by the Bank for International Settlements found that the overwhelming majority of retail investors in Bitcoin, around 73–81%, lost money on their initial investment.[52] Investors that lose money on their crypto investments may be forced to sell assets that they hold in other markets, thus putting a downward pressure on prices. As a result, contagion can spread to unrelated markets.

It should be noted here that leverage is an inherent characteristic of crypto markets because crypto exchanges allow investors to take highly leveraged positions and borrow heavily. Leveraged positions are the first to be unwound and additional selling activity adds further downward price pressure,[53] further diminishing the value of crypto assets as collateral. In addition, given the liquidity problems facing crypto markets, namely the imbalances between supply and demand, users of crypto lending also face a marked settlement risk, i.e., the risk that their trade will not settle, and their position will remain open.

What is more, widespread incidents of fraud have been observed in the crypto lending markets. The opaque and complex nature of crypto lending provides fertile ground for fraudsters. For example, in July 2022, the Securities and Exchange Commission (SEC) issued a cease and desist order against US crypto lender Voyager for falsely presenting itself as being covered by the US Federal Deposit Insurance Corporation (hereinafter 'FDIC'), misleading users into believing that their deposits were insured by the FDIC and the FDIC would insure them against the failure of

[48] Nelson and Schickler (2022).

[49] See Elliott et al. (2014).

[50] According to the FSB, this is also the main risk that non-bank financial intermediation poses to the regulated sector. Even though the interconnectedness between NBFI operators and institutions in the regulated sector is very limited, liquidation of positions in asset markets (fire sales) that regulated financial institutions carry on their balance sheets presents stability and solvency issues for regulated institutions as well. This effect is the main systemic risk concern emanating from the crypto sector. See FSB (2022a).

[51] Thouvalas (2022).

[52] Auer et al. (2022).

[53] See Avgouleas (2010) and Shleifer and Vishny (2011).

Voyager.[54] Finally, concerns have been raised regarding the potential use of crypto lending as a vehicle for money laundering, tax evasion and terrorist financing.

3.2 Proposed Regulatory Response: A Prudential Regime for Crypto Lenders

The activities of crypto lenders, which involve the taking of deposits in crypto assets and the granting of crypto loans, resemble the activities of credit institutions. Pursuant to the Capital Requirements Regulation (CRR), a credit institution is defined as an 'undertaking the business of which is to take deposits or other repayable funds from the public and to grant credit for its own account'.[55] Credit institutions are subject to a strict licensing regime built upon the prudential rules introduced by the Capital Requirements Directive (CRD) and the Capital Requirements Regulation.[56] The rules apply to banks and investment firms and include stringent capital requirements and liquidity requirements. Moreover, prudential oversight under the Regulation extends to corporate governance provisions which seek to ensure the independence and diversity of the board of directors and strengthen risk management.[57] Systems and controls requirements would make sure that crypto lenders remain safe from the risk of cyber attacks. Furthermore, the prudential rules impose remuneration restrictions, whose goal is to promote prudent risk-taking and ensure that remuneration policies are aligned with the long-term interests of the institutions.[58] Given that crypto lenders satisfy the definition of credit institutions under EU law, EU bank prudential regulation should be extended to crypto lenders as an effective remedy against the risks created by crypto lending. As a result, crypto lenders would need to be licensed and follow the complex web of prudential rules imposed by the CRD and CRR. The application of a national regulatory regime is another possibility. Nevertheless, taking into account that the activities of crypto lenders resemble

[54] Federal Deposit Insurance Corporation and Board of Governors of the Federal Reserve System (2022), p 1.

[55] Art. 4(1)(1) of Regulation (EU) No 575/2013 of the European Parliament and the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No 648/2012.

[56] The CRD package implemented the Basel III agreement adopted in the aftermath of the financial crisis.

[57] The rules, e.g., impose limits on the number of directorships, mandate the separation of the positions of chairman and CEO, and provide for training and induction for new board members and periodic self-evaluation exercises. Furthermore, significant institutions are required to establish a remuneration committee, a nomination committee composed of non-executive members and a risk committee composed of non-executive board members. Institutions must have a risk management function independent of the operational function. The risk management function must be actively involved in elaborating the institution's risk strategy. See Clarke (2020).

[58] Remuneration policies should be consistent with and promote sound and effective risk management, policies should be in line with the firm's business strategy, objectives, values and long-term interests of the firm, and the implementation of the remuneration policy should be subject to central and independent internal review by the firm's management body at least annually. The remuneration rules impose stringent limits regarding the structure of remuneration, including a bonus cap, capping variable remuneration at 100% of the fixed component for material risk-takers. The bonus can be raised to 200% of the fixed remuneration with shareholder approval. See EBA (2015).

the activities of banks, which are regulated at EU level, and that crypto lenders satisfy the definition of a credit institution under the CRR, the application of the EU's prudential bank regulatory regime is the appropriate solution.

Crypto lenders are currently not captured by banking regulation. In the US, numerous state regulators and the SEC have taken the view that the interest-bearing accounts offered by crypto lenders are unregistered securities. For instance, in February 2022,

the SEC charged BlockFi, a major crypto lender, with failing to register the offers and sales of its retail crypto-lending product.[59] BlockFi offered so-called Interest Accounts ('BIAs') to investors, through which the latter lent crypto assets to BlockFi in exchange for BlockFi's promise to provide a variable monthly interest payment. BlockFi generated the yield paid out to investors by making loans of crypto assets, lending dollars and investing in equities and futures. The SEC determined that the products offered by BlockFi were investment contracts pursuant to the Howey test.[60] In particular, the SEC held that investors in BIAs had a reasonable expectation that BlockFi would use the invested crypto assets in BlockFi's lending and principal investing activity and that they would obtain a future profit in the form of interest payments, resulting from BlockFi's efforts. As a result, the SEC considered that BIAs were securities, which were required to be registered with the SEC. BlockFi violated the Securities Act of 1933 by offering and selling securities without filing a registration statement.

As a result, US regulators seek to regulate crypto lenders and protect the public against their risks via securities law. Nevertheless, securities regulation is not suitable for tackling the risks posed by crypto lending. Instead, it may exaggerate financial instability. Securities regulation is based on disclosure.[61] In the event of a market panic, market players do not act rationally and it is unlikely that they will stop 'running' when faced with more information. On the contrary, the disclosure of more, usually negative information, will accelerate the run.[62] For instance, according to numerous commentators, fair-value disclosures contributed to the financial crisis of 2008–2009 by increasing leverage during boom times and accelerating write-downs during the bust.[63]

Cranston et al. define prudential regulation as the thick and complex web of rules employed to (a) keep financial institutions safe and a going concern, and, failing that, (b) to assist their resolution and/or restructuring, and (c) to augment the resilience of financial systems to withstand shocks.[64] Even though crypto lending is a form of narrow banking and the usual rationales for prudential regulation, namely

[59] In the Matter of BlockFi Lending LLC, SEC Order.

[60] Pursuant to the Howey Test 'an investment contract for purposes of the Securities Act means a contract, transaction or scheme whereby a person invests his money in a common enterprise and is led to expect profits solely from the efforts of the promoter or a third party.' Securities and Exchange Commission v. *W. J.* Howey *Co.*, 328 U.S. 293 (1946).

[61] Mahoney (2021), Mahoney (1995) and Coffee Jr (1984).

[62] Avgouleas (2009).

[63] Laux and Leuz (2010), pp 93–118.

[64] Cranston et al. (2018), p 31.

fractional reserve and depositor protection, may not apply, the risks created by the crypto-lending industry are important enough to justify the full panoply of prudential regulation. As the Celsius and Voyager debacles demonstrated, crypto lenders face the risk of investor runs, which can lead to their demise, triggering a cascade of failures in crypto markets. Turbulence in crypto markets can quickly spread to the mainstream financial system, posing a threat to global financial stability. What is more, crypto lending is a very important segment of open finance markets. However, paradoxically, crypto lending is introducing a new form of intermediation in the open finance market, with the operations of crypto lenders resembling those of banks. Consequently, taking a functional approach, regulation should not distinguish between the two types of intermediaries, i.e., the mainstream lending institutions and crypto lenders.[65]

Crypto lenders satisfying the definition of a credit institution would need to be licensed in accordance with the Capital Requirements Directive and the criteria it imposes for the assessment of licensing requests. The ECB has stated that when assessing licensing requests covering crypto-asset activities and services, the ECB and the national competent authorities must examine how the proposed activity matches the overall activity and risk profile of the institution, whether the institution's policies and procedures are adequate to identify and tackle the risks unique to crypto assets and whether senior managers and board members have knowledge and experience in IT and crypto markets.[66] The application of these licensing criteria would ensure that only crypto lenders with sound business models and internal governance and competent senior management would be able to obtain a license as credit institutions.

Prudential regulatory tools include capital requirements,[67] liquidity requirements,[68] corporate governance and remuneration rules, lender of last resort facilities and deposit insurance.[69] The application of prudential rules, excluding lender of last resort and deposit insurance arrangements in order not to heighten moral hazard, would have averted the recent collapses of Voyager and Celsius. Adequate capital reserves would have ensured the stability of crypto-lending operators and reduced the risk of bankruptcy. The balance sheet hole would have been covered. Prudential

[65] In its proposed framework for the regulation of crypto-asset activities the Financial Stability Board states that where crypto assets and intermediaries perform an equivalent economic function to one performed by instruments and intermediaries in the traditional financial system, they should be subject to regulations in line with the principle of 'same activity, same risk, same regulation'. See FSB (2022b), p 1. As a result, the FSB argues in favor of extending prudential rules on capital and liquidity to crypto-asset companies when undertaking similar functions to banks. See FSB (2022c), p 6 and Annex I.

[66] ECB (2022).

[67] It should be noted that the exact requirements for own funds that banks should set aside for exposure to the crypto-market risk are not known until the BIS finalizes its prudential standard for credit institutions' exposure to the crypto markets. BIS (2022).

[68] Liquidity requirements are composed of the Liquidity Coverage Ratio and the Net Stable Funding Ratio. The Liquidity Coverage Ratio seeks to ensure that institutions have enough liquid assets to withstand a 30-day stress period. The Net Stable Funding Ratio forces institutions to finance long-term assets with long-term liabilities. See Bonner and Hilbers (2015).

[69] Armour et al. (2016), p 279.

regulation would also have prevented concentration of the balance sheet on a single asset class. Moreover, liquidity requirements would have required crypto lenders to hold some of their assets in liquid form, thus ensuring that they had enough funds to repay users and avert the run. Corporate governance standards and remuneration rules would have guaranteed effective risk management and prevented excessive risk-taking. For instance, Celsius's collapse can in part be attributed to the losses suffered from erroneous and risky asset deployment decisions, such as investments in long-term and illiquid assets.

To avoid giving false assurances to crypto-lending users, we do not suggest here that crypto lenders should benefit from deposit insurance schemes or lender of last resort facilities. The application of deposit insurance and lender of last resort facilities to crypto lenders could create moral hazard and lead to implicit government guarantees being extended to crypto lenders.[70] This would prevent crypto lenders from turning into yet another category of too-big-to fail institutions. In the absence of the safety net provided by deposit insurance and lender of last resort facilities, liquidity requirements within prudential regulation are the only way to alleviate the liquidity risks that crypto lenders face. Finally, a licensing regime would also facilitate the segregation of crypto-asset holdings within the organization, which would boost crypto lenders' stability[71] and offer protection against any designs by crypto operators to misappropriate client holdings. Apart from boosting the stability of individual crypto lenders, prudential regulation would also enhance regulatory scrutiny and market discipline.

The additional benefit of a licensing regime for crypto lenders is that licensed institutions would also be subject to the MiFID II product governance regime,[72] and thus they would have to disclose to users the historical volatility and default rates of their products, thus minimizing any attempts to mislead the investors about the true risks of the product and maximizing user/consumer protection. The product governance requirements introduced by MiFID II have proved to be among the most important elements of the MiFID II investor protection framework, aimed at ensuring that firms act in their clients' best interests during all stages of the investment product's life cycle and preventing mis-selling. As part of the product governance requirements, a target market of end clients must be identified and periodically reviewed for each product, as must a distribution strategy that should be consistent with the identified target market. Furthermore, assuming that crypto lending could be used for money-laundering activities, authorization would resolve this concern by default because authorized institutions would impose Know Your Customer ('KYC') safeguard requirements on their customers.

[70] On how deposit insurance creates moral hazard, see Calomiris (1990) and Fischer (1999).

[71] 'Robust segregation and separation between traditional business and crypto business are desirable, although group-wide and step-in risk would also need to be considered even when crypto businesses are located in a separate entity'. IMF (2019). See, inter alia, IMF blog available at https://blogs.imf.org/2021/10/01/crypto-boom-poses-new-challenges-to-financial-stability (accessed 03 Mar 2023).

[72] For an overview of the MiFID product governance regime see Avgouleas and Seretakis (2022), pp 27–28, and Colaert (2019).

4 Conclusion

This article has examined the mechanics of a key segment of crypto markets. It has also suggested that crypto lenders should be licensed and regulated as credited institutions under EU law in order to boost the stability of the crypto-lending sector and create a level playing field with mainstream lenders such as banks. A careful examination of recent failures has shown that the sector is very unstable and ripe for drastic regulation, which will stabilize the sector, limit the risk of contagion triggered by depositor runs and prevent future bankruptcies. It should be noted that Awrey and Macey also suggest a licensing regime for data aggregators in the case of open banking.[73] But the authors' suggestion refers to controlling market power, not boosting financial stability like the present proposal. A plausible alternative to licensing would be to systematically curb the promotion of crypto-lending schemes by consumer protection regulators. Nevertheless, the regulation of crypto-lending schemes from a consumer protection perspective may not be sufficient to tackle the financial stability risks emanating from their activities.

Arguably, a licensing regime for crypto lenders may herald the end of DeFi as an unregulated market segment. But it should be noted here that other parts of the crypto markets, such as trading, will remain unaffected. The application of prudential regulation to crypto lenders will certainly increase the compliance burden and costs, eroding crypto lenders' profits. However, the recent FTX debacle has revealed that the business model and profits of many crypto firms are the result of regulatory arbitrage, weak corporate governance, excessive risk-taking and outright fraud. Moreover, the unregulated nature of crypto lending offers crypto lenders an unfair advantage over regulated financial institutions such as banks, which are subject to stringent prudential and conduct of business rules. While there is no evidence of any concrete benefits brought about by crypto lending, the level and kind of risks (market failures) associated with this activity fully justify invasive regulation, and prudential regulation is the most effective tool to control this activity.

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[73] According to the authors, data aggregators are technological platforms that develop and manage application programming interfaces designed to access the customer data held by incumbent financial institutions and to share it with fintech disruptors. The authors argue that a small handful of data aggregators erect substantial barriers to entry and exert monopoly power, thus becoming a new breed of too-big-to fail institutions. Awrey and Macey (2022), p 22.

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