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Analysis of Terra/Luna Collapse and Fraud Liability under Polish Criminal Code in Light of MiCAR and MiFID II Amendments

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The article considers implications of algorithmic stablecoins, with a particular focus on the Terra/Luna ecosystem and their impact on the financial and regulatory landscape. It examines the collapse of TerraUSD (UST) and its subsequent effects on the global cryptocurrency market. The article delves into the mechanics of UST's pegging mechanism, which relied on complex algorithmic adjustments without fiat collateral, leading to its dramatic devaluation. The study highlights the regulatory challenges posed by decentralized financial systems and algorithmic stablecoins, emphasizing the difficulties in legally addressing the actions of creators within a system perceived as a financial pyramid. It underscores the need for clearer regulatory frameworks, not only in Polish legislation but also under the MiCA (Markets in Crypto-Assets) regulation in the EU, along with similar legislative efforts globally. By analyzing the systemic risks and vulnerabilities exposed by the Terra/Luna collapse, the article advocates for a balanced regulatory approach that ensures investor protection while fostering innovation.

Key words: virtual asset, stablecoin, DeFi, TerraUSD, MiCAR, financial instrument, Yield farming, Anchor Protocol, fraud

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1. Background

The period between May 4 and May 12, 2022, saw the worst stablecoin market crash in history. Within a few days, the Luna cryptocurrency (LUN) fell from USD 87.96 to USD 0.004. The decline was caused by "depegging" the related stablecoin — TerraUSD (UST) from its USD 1 value. This situation sparked a spiral of fear and caused a bank run leading to a widespread UST sell-off. As a result, this led to the collapse of the entire Terra system, a decline in its value by about 99%, and investors' losses amounting to tens of billions of dollars. At the same time, this collapse started a chain reaction, dragging all the crypto-assets behind it and causing huge drops across the sector estimated at USD 500 billion.

The following study will first attempt to answer the question

of how the system collapsed. Is it possible, given the actual state of affairs, to accuse the creators of the system or people who encouraged them to invest capital that they benefited from its operation? In the opinion of many, it was a Ponzi scheme of the 21st century. So, was that misleading people into investing their assets in the system in question? What legislative solutions can be proposed to strengthen the security of investors in this area of crypto-assets?

As an introduction, it is necessary to briefly[1] recall the differences between typical virtual currency systems and stablecoins. Virtual currencies are an asset extremely susceptible to external world events, market sentiments, or even tweets,[2] which caused huge fluctuations in cryptocurrency prices inherently associated with them, often leading to their collapse. The market's response to this instability would be stablecoins ("stable virtual currencies"). The paradigm of their operation is based on maintaining a stable price fixed to an asset (usually some fiat currency in a 1:1 *ratio*), allowing one, according to one of many taxonomies, to distinguish four main types of such safeguards:

- fiat-collateralized,
- crypto-collateralized,
- commodity-backed,
- not backed.

The flagship and most popular example of a stablecoin is Tether (USDT)[3] with a value of $1 (USDT 1 = USD 1). So, this is an example of the first of the above types of safeguards. In the case of Tether, the guarantee of mutual convertibility of USDT 1 per USD 1 was provided by an economic entity that is a centralized issuer of such an asset (Tether Holdings Ltd.). In other words, this model can be illustrated by Tether Holdings Ltd.'s obligation to convert USDT 1 to USD 1 and USD 1 to USDT 1. The backing to cover claims for the redemption of tokens should be reflected in real assets, without which, in the event of a collapse of the exchange rate, the entire system will be stable in name only. There is indeed such a backing, at least partially, in the case of the USDT. In a model solution, those interested in buying USDT 1 pay USD 1 to the managing entity account and receive a newly "minted" USDT 1. This dollar also serves as collateral: in the event that the managing entity wants to make the opposite transaction, it has the funds for it. The second model is based on specifically securing the value of such a stablecoin using other cryptocurrencies. An example of such a stablecoin is DAI. In the third model, the value of the stablecoin is linked to the value of underlying assets or commodity assets, such as gold, silver, or real estate, with each unit representing ownership rights to these assets. In this model, the stability and value of the stablecoin are derived from the tangible assets it represents, providing a reliable mechanism for maintaining value amidst market fluctuations. Examples include Digix Gold, Perth Mint Gold Token (PMGT), or Pax Gold (PAXG), which are backed by gold, and SwissRealCoin, whose value is tied to a portfolio of Swiss commercial real estate.

2. TerraUSD as an algorithmic stablecoin

The fourth model is more interesting from the point of view of legal and economic analysis. Its example[4] is the TerraUSD (UST) stablecoin with the corresponding Luna (LUN) virtual currency, which is the subject of this study. This system is called an algorithmic stablecoin. Theoretically, inclusion in the stablecoin category should mean that it has some kind of security. In fact, it is only secured by a "program code," making it realistically a "non-backed" at all. It was created[5] by two Koreans: Daniel Sin and Do Kwon, who also

1 Discussion of the stablecoin ecosystem deserves a separate monograph, hence the issues presented in this study repeatedly refer to the considerations made in other studies. See especially: A. Behan, *Waluty wirtualne jako przedmiot przestępstwa* (Virtual currencies as an object of crime) (Krakowski Instytut Prawa Karnego Fundacja, 2022).

2 E. Oosterbaan, *The Elon Effect: How Musk's Tweets Move Crypto Markets* (2021), https://perma.cc/84G2-B68J (access: 14.07.2022), points to numerous tweets by Elon Musk which shook the virtual currencies market, leading to huge increases or equally spectacular drops in their value.

3 Its name indicates that the token is "tethered" to the value of the USD.

4 See also Behan, *Waluty*, *op. cit.*; R. Kozhan, G. Viswanath-Natraj, *Decentralized Stablecoins and Collateral Risk. WBS Finance Group Research Paper* (2021) https://ssrn.com/abstract=3866975 (access: 02.06.2024).

5 E. Kereiakes et al., *Terra Money: Stability and Adoption* (2019), https://perma.cc/D3XA-ZXBJ (access: 02.06.2024)

founded Terraform Labs – the management foundation of TerraUSD and Terra Luna. As opposed to the centrally managed USDT, UST stabilizes the price algorithmically using smart contracts, and maintaining the price of UST 1 equal to USD 1 was to be used by the "classic" virtual currency Luna (LUN) associated with UST. While it is also called a balancing token,[6] it is essentially a regular virtual currency that is prone to price fluctuations and should in theory absorb a price volatility shock, and according to the creators' intention, it was aimed at stabilizing the UST price using defining algorithms. To create or "mint" a new UST "coin" or "unit", you must "burn" a $1 worth LUN. Likewise, you can then sell UST and receive a LUN in return.

TerraUSD operated as an algorithmic stablecoin, relying on automated protocols to maintain its peg without the backing of traditional fiat reserves.

To illustrate the above relationship, it needs to be pointed out that UST 1 could always be exchanged for the value of LUN with a market value of USD 1. It should also be added that UST tokens could only be purchased and sold using the LUN. Every time such a transaction occurs, UST is taken out of circulation ("burned") by smart contracts programmed to keep the price stable. So, if LUN 1 costs $30 and UST 1 costs USD 1, then you can buy LUN 1 for UST 30 or make the opposite transaction, i.e. sell LUN 1 for UST 30. Such an exchange does not explain who controls the USD 1-UST price or why it should be rigid. The explanation for this phenomenon lies in the possibility of arbitrage.

3. Arbitrage and lack of collateral

When the UST price deviates from USD 1 and rises to e.g. USD 1.01 (still having the "stable" convertible value of USD 1), you can sell (consequently "burn") LUN tokens worth USD 100 for UST 100, which will give the seller a real value of 100×USD 1.01, thus a profit of 1%. The profit appears to be modest, but given that thousands of such transactions can be made within an hour, it shows the potential to earn a lot of money. However, such an operation will simultaneously increase the number of UST, and thus reduce its price (during the transaction LUN was "burned" and UST "minted"). Likewise, if the UST value drops to USD 0.99, for example, you will be able to buy LUN 1 worth USD 100 for UST 100 worth USD 99, earning 1% again.

The purpose of both opposing mechanisms was to balance the UST price so that it would not deviate from USD 1 allowing the system to stabilize itself thanks to user operations. Due to the limited length of this study, this mechanism is presented in a very simplified model, with the sole purpose of showing that the safeguards of the system's value are based on trust in smart contracts and are not covered by any actual assets. The whole idea is based on the assumption that any movement in the UST price relative to the base value of USD 1 will make traders want to earn and thus stabilize the price.

It should be emphasized that, unlike, for example, the Tether, the TerraUSD crypto currency did not have (at least initially) any collateral in its monetary assets. Securing the value of an algorithmic stablecoin relies – as the ECB aptly put it in its stablecoin study – solely on the expectation of its future market value.[7]

6 This operating model is used not only by the Terra system. The same model as UST↔LUN is also available for the Stablecoin neutrino USD↔WAVES.

7 ECB Crypto-assets Task Force, "Stablecoins: Implications for monetary policy, financial stability, market infrastructure and payments, and banking supervision in the euro area", *Occasional Paper Series* 247 (2020), https://perma.cc/QAF3-BNXM (access: 02.06.2024).

Clements states it is plain to see many risks to consumers or institutional investors who – lured by the promise of a high return on their investment – decide to entrust their funds to such tokens.[8] It is also worth explaining the purpose of the existence of stablecoins in the crypto-asset ecosystem.

The design of TerraUSD, as an algorithmic stablecoin, exposed it to significant vulnerabilities, including susceptibility to rapid devaluation due to its lack of fiat collateral.

With USD 1 and wanting to hold on to this resource, no one has a reason to convert it to USDT 1 or UST 1 to be able to convert it back to USD 1. Such a change would not be economically justified, since it is possible to keep USD, e.g. in bank accounts. The practicality of using stablecoins can only be seen when they work in cooperation with other crypto-assets. Here you can, for example, indicate the classic model of buying and selling Bitcoin (BTC) or Ether (ETH) for fiat currencies in order to earn on the fluctuations of the cryptocurrency exchange rate. Such a conversion (e.g. USD to BTC, BTC to USD) – made in the main chain – involves relatively high transaction fees, which may make such multiple exchanges unprofitable. Stablecoins are to be a solution to this problem. They allow traders to stay in the crypto-asset ecosystem and trade with theoretically stable virtual currencies at incomparably lower transaction costs.

4. Yield farming and Anchor Protocol

The last element necessary to explain how the entire system collapsed, and at the same time crucial from the point of view of criminal law analysis of the concept of "misrepresentation", is the passive earning model. Yield farming is a model in which cryptocurrency holders can transfer their units to dedicated smart contracts in the decentralized finance (DeFi) ecosystem.[9] They do this with the purpose of lending them to other users, enabling them to obtain passive income from their funds. The system is based on a model that uses the operation of automated market makers (AMM), including liquidity providers (LPs) – i.e. people who stake,[10] i.e. make their funds available to the pool – and the liquidity pools (LP) themselves.

This system is similar to the deposit and loan model known from traditional banking. However, it lacks a centralized managing entity (bank), instead, it is based entirely on the code of a given smart contract. Anyone who has units of a given cryptocurrency can send them to a selected smart contract with a guarantee (as long as there are no bugs or gaps in the smart contract itself that could make it vulnerable to attack) of return of the provided capital together with due interest. The DeFi ecosystem and the applications built on it made it possible to offer specific deposits with the promise of a profit of more than ten percent.[11] Thus, it created a kind of decentralized vaults which borrowers, after paying an appropriate fee, could also use. This method of capital management is a completely different approach from the so-called HODL,[12] but

8 R. Clements, "Built to Fail: The Inherent Fragility of Algorithmic Stablecoins", *Wake Forest Law Review Online* 131 (2021), http://dx.doi.org/10.2139/ssrn.3952045 (access: 02.06.2024).

9 Anonymous, *Yield Farming in DeFi: A Complete Guide* (2022, July 11), https://perma.cc/J5GC-666C (access: 02.06.2024).

10 Anonymous, *What Is Binance DeFi Staking and How to Use It* (2020, August 19), https://perma.cc/YSG8-9CJK (access: 02.06.2024).

11 There were also those that offered over 1000% APY.

12 HODL, hodl, or hodling – a phrase that has adopted a slip of the tongue. In 2013, a user named "GameKyuubi" on

also requires a much higher level of awareness from the user. One can choose from hundreds of LP, each of which offers a different level of risk and a different rate of return.

In the discussed case, Anchor Protocol – ANC created by Terraform Labs in March 2021 was of significant importance.[13] It was a DeFi loan protocol operating on the Terra network, offering returns of 20% Annual Percentage Yield (APY).[14] It was possible to maintain the high liquidity of the system thanks to the blocking of funds in smart contracts.[15] The question of what was the source of funds to cover interest on these deposits requires consideration. Theoretically, the mechanism was supplied with funds from fees for granting loans.[16] In practice, however, the APR of borrowers was around 12%, so it did not cover the ever-increasing amounts blocked in Anchor and the interest that had to be paid to the lenders. These funds, which will be discussed later in the study, were according to Godbole paid from the reserve fund.[17] The ever-growing popularity of the system, driven by the growing number of users who received the promised returns by investing their funds, became at the same time one of the first reasons for the collapse of the entire network. Increasingly, Total Value Locked (TVL), illustrating the value of funds blocked in smart contracts, increased from around USD 3 billion in July 2021 to around USD 30 billion at the beginning of May 2022. Over 70% of Terra's holders held their funds in instruments of the Anchor protocol. This led to consequences which were easy to predict: increased lenders counting on a "safe and secure" profit were not offset by the same dynamic growth of borrowers, which finally started the collapse of Terra. In February 2022, the creators of the system recapitalized Anchor with $450 million[18] to provide funds for interest payments. This only exacerbated the crisis as it heightened the expectation of further returns among users and ensured the liquidity of the network only for a moment. In April 2022, the extraordinary popularity of this passive earning model made the Terra ecosystem the third largest stablecoin in the world when it comes to capitalization, placing it among the top ten most popular cryptocurrency sys-

BitcoinTalk wrote in the thread titled "I AM HODLING" instead of "I AM HOLDING." HODL has become a commonly used term in the crypto world for cryptocurrency investors who refuse to sell their cryptocurrency regardless of price increases or decreases.

13 Anonymous, *Anchor documentation site* (2022), https://perma.cc/9E6D-ELEG (access: 02.06.2024).

14 That is annual rate of return on investment or the annual percentage yield, although it is in essence the APRC. It includes compound interest, compounding or increasing with the balance, including interest earned on the initial deposit and interest on this interest. The concept of Annual Percentage Rate (APR) is also used to measure profitability, i.e. the annual interest rate, which, unlike APY, does not take into account the compounding of interest.

15 Of course, this is only a very fragmented and simplified presentation of the entire yield farming ecosystem – which deserves a separate monograph – and its purpose is only to familiarize the reader with the foundations on which the entire system was based.

16 There were three such sources – interest paid by borrowers, funds obtained from liquidation fees, and funds obtained from collaterals from borrowers (bonded luna, bLuna, or bonded ether, bETH). See, especially Anonymous, *Bonded Assets (bAssets)*, (9 July 2022), https://perma.cc/8NFN-J3N8 (access: 24.07.2022).

17 O. Godbole, *Anchor Protocol Reserves Slide as Money Market's Founder Talks Down Concerns* (2022), https://perma.cc/DC55-MPQQ (access: 02.06.2024).

18 In January and February 2022, the reserve manager of the Terra ecosystem with an unclear legal relationship to it but associated with the Luna Foundation Guard (LFG) system, began to buy BTC in order to additionally secure the system, which part of the market interpreted as a lack of faith in its own system. According to Hazel, *Luna Foundation Guard Has Acquired an Additional 37,863 Bitcoins Worth $1,5 Billion* (2022), https://perma.cc/YHZ2-XVTE (access: 02.06.2024), some researchers, for instance Ryan Clements, associate professor of economic law at the University of Calgary, have suggested that "this may create an incentive (effectively economic temptation of fraud) to use discounted BTC purchasing strategies." An attack on Terra, aimed at causing a sell-off and consequently leading to the liquidation of substantial amounts of BTC securing them, could provide an opportunity to create BTC buy short positions (due to a sudden increase in the supply of BTC). On April 13, LFG bought an additional 2,500BTC, and on May 6, another 40,000BTC for the amount of approximately 1.5 billion USD.

tems.[19] Investors' willingness to earn quick and high returns fueled the popularity, rather than a belief in the system itself. They frequently switched between protocols in search of the most profitable one, without strong attachment to any particular model or currency. This turned out to be fateful.[20]

5. Collapse of the system

On April 5, 2022, Luna peaked at USD 119.2 and three weeks later, the rising demand for the UST pushed the number of Luna tokens to their lowest value. On May 7, mass liquidation of deposits in the Anchor protocol began, leading to a decrease in their value within a few hours from approx. USD 14 billion to approx. USD 8.7 billion. It was certainly influenced by rising interest rates, inflation and stock market drops in the Big Tech sector. Some community members point out that it could be part of a plan to "deppeg" UST from USD 1 to cash in on shorting BTC.[21]

The sudden sale of a massive volume of UST on the Binance exchange triggered a supply shock, kicking off a spiral of LUNA's sharp sell-offs, further exacerbating UST's USD 1 deviation and fueling panic. On May 9, due to the risk of liquidation of large volumes of BTC, its price dropped to USD 33,000, LUN fell by 17% and UST stopped at USD 0.98. In order to restore the value to USD 1, LFG announced that it was going to borrow USD 1.5 billion in BTC and UST,[22] which, however, did not prevent further declines. LFG, in order to save the value, was forced to sell over 42.000 BTC worth around USD 1.3 billion with a significant loss (bought at USD 40.000, sold at USD 30.000), which allowed the attackers who shorted BTC before the attack to profit.[23] This only deepened the FUD (Fear, Uncertainty, Doubt) on the market, leading to a further panic sale of UST, blocking the possibility of selling UST on the Binance exchange for a few hours and causing further intensive withdrawal of funds from Anchor to the value of several hundred million USD (from approx. USD 16 billion earlier),[24] which in turn triggered the cryptocurrency bank run and drops throughout the crypto sector.

On May 12, LUNA's price dropped by 99.7% to $0.1 within 24 hours,[25] to reach $0.0000008 on UST $0.15 on May 13. On the same day, Binance decided to withdraw Luna from its exchange. The decision was changed a day later following Do Kwon's announcement of a "recovery plan." It was supposed to rely, i.a. on printing a billion new LUNAs to stabilize UST, but the massive sell-off of USDT only led to a 1.9 million percent[26] increase in the number of tokens, completely

19 See also S. Malwa, *Terra's LUNA Surges 17% as UST Becomes Third-Largest Stablecoin* (2022, April 19), https://perma.cc/Z7F2-Z89M (access: 02.06.2024).

20 It allowed for a quick spiral of fear and rapid asset sales because there was no high degree of attachment to these assets, as is the case with, for example, BTC.

21 Mudit Gupta [@Mudit_Gupta], Tweet, https://twitter.com/Mudit__Gupta/status/1523306186761596929, (access: 02.06.2024).

22 See also: S. Reynolds, *Luna Foundation Guard Lends $1.5B in BTC and UST for Stablecoin Peg* (2022), https://perma.cc/XJZ2-XP2J (access: 24.07.2024) and D. Kwon [@stablekwon], Tweet (2022), https://twitter.com/stablekwon/status/1523532474860539905 (access: 24.07.2024).

23 See Onchain Wizard [@OnChainWizard], Tweet (2022), https://twitter.com/OnChainWizard/status/1524123935570382851 (access 24.07.2024) and 4484 [@4484], Tweet (2022), https://twitter.com/4484/status/1524006086147252227 (access 24.07.2024). At the end of May, a report by the analytical company Nansen was published (A. Barthere et al., *On-Chain Forensics: Demystifying TerraUSD Depeg* 2022, https://perma.cc/2GKL-U6BG [access 24.07.2022]), thoroughly discussing the transactions that led to the so-called USDT's depegging from USD, concluding that USDT lost its 1:1 relationship to USD because many big stablecoin holders felt it was too risky to hold tokens, so they sold them. The report reads: "We refute the popular narrative of one 'attacker' or 'hacker' working to destabilize UST. The depeg of UST could instead have resulted from the investment decisions of several well-funded entities, e.g. to abide by risk management constraints or alternative to reduce UST allocations deposited into Anchor in the context of turbulent macroeconomic and market conditions."

24 See graph at Anonymous (2022, July 10), https://perma.cc/UL3Y-EHU5 (access: 02.06.2024).

25 See more S. Malwa, *Terra's LUNA Has Dropped 99.7% in Under a Week. That's Good for UST* (2022, May 12), https://perma.cc/2KEF-KK4J (access 24.07.2022).

26 From 342 million to 6.5 billion. See A. Martinez [@ali_charts], Tweet (2022), https://twitter.com/ali_charts/status/1525816636774797312 (access: 02.06.2024). It needs to

crashing the system.[27] On May 16, Do Kwon proposed a hard fork[28] – the new UST system, with no stablecoin anymore, and changing the name of the network to Terra 2.0. The system has been approved by validators. Existing Luna and UST holders received a native token for the new Luna blockchain (LUNA) based on

The collapse of TerraUSD had a significant impact on the global cryptocurrency market, underscoring the fragility of algorithmic stablecoins without adequate collateral. The dynamics of the Terra ecosystem, particularly the imbalance between lenders and borrowers in the Anchor protocol, played a key role in its downfall.

their resources. The old Terra blockchain remained functional, changing its name to Terra Classic. With it, the names of the old tokens changed – from Luna (LUN) to Luna Classic (LUNC) and from UST to USTC. According to the documentation the new chain was named Terra, with the Luna currency (LUNA) but without the UST stablecoin.[29]

Losses caused by the collapse of this system are counted in tens of billions of dollars, which have not so much been defrauded or changed hands, but simply disappeared from the market due to a spectacular loss of value by something that – paradoxically – had never had any real value. Press reports informed about 280 thousand Korean citizens who had money invested in LUNA,[30] or about institutional investors such as the Three Arrows Capital hedge fund, which lost around $200 million as a result of the collapse of the system.[31] On Reddit, the channel devoted to the fall of Terra has almost 50,000 members reporting on the losses they suffered, and the channel itself, after reports of suicide

be clarified how several billion Luna tokens were created within a few days. In short, as mentioned in the earlier part of the study, the sale of UST is associated with the creation of Luna. At a Luna price of $ 100, for example, "burn" and $ 1 USTD will create 0.01 Luna. However, at a price of 0.0008, "burning" USDT 1 will generate 12.500 Luna tokens, which – with thousands of transactions and the ever-declining price of Luna – eventually created billions of new units.

27 It should therefore be noted that even in the world of crypto assets and the decentralized DeFi product, it is possible, with the consent of the community, to "print" additional money.

28 For further reading on forking, see Behan, *Waluty*, 209 ff.

29 Anonymous, *Exchange migration guide* (2022, July 11), https://perma.cc/BRC9-FHTU (access: 02.06.2024).

30 S. Jung-a, *South Korea launches investigations into company behind luna crypto cash* (2022), https://perma.cc/8UMD-FQME (access: 02.06.2024).

31 See also S. Malwa, *3AC confirms near $200 million loss from Luna collapse. 'The Terra-Luna situation caught us very much off guard* (2022, June 17), https://perma.cc/KFV4-FR6V (access: 02.06.2024). It was reported in June 2022 (J. Encila, *Three Arrows Capital Founders Nowhere to Be Found, Liquidators Say* (2022), https://perma.cc/HVP6-AJ22 (access: 02.06.2024) that Three Arrows filed for bankruptcy in the British Virgin Islands, and on July 12, 2022, the consulting firm Teneo, which is set to liquidate the remaining assets of the fund, announced that it could not determine the location of the founders and there was "imminent risk" of transfer of remaining cash and assets abroad, and thus the inability to satisfy creditors.

by investors who lost their goods, posted a telephone number for a suicide helpline.[32]

Interestingly, this collapse could not have come as a surprise to keen observers of the crypto-asset market. It cannot be ignored that an analogous manner of operation was noticed a year earlier in the Iron Finance project, which was based on the IRON stablecoin (equivalent to UST) and the TITAN balancer (equivalent to the LUN). It was the first major bank run in the DeFi world, resulting in losses of billions of dollars.[33] Therefore, the critical opinions of many people who treat the analogous model of another algorithmic stablecoin (Terra) as a financial pyramid are not surprising, taking into account the foundations on which it is based and the model it operates.[34] However, it required, as in every financial pyramid, a constant inflow of new customers interested in taking loans or then participating in the network, and the system collapsed after exceeding the minimum threshold of inflow of such network participants.

This regularity applies especially to systems in which, firstly, there is no central entity capable of limiting the risk of panic on the market in order to prevent a collapse, and, secondly, no entities are legally obliged to protect investors' capital or undertake arbitrage actions aimed at stabilizing prices. All of this, combined with the lack of any real algorithmic stablecoin backing, led to the collapse that is the subject of this discussion. The business model Anchor adopted was, in fact, unsustainable eventually, since several million dollars of interest on capital were paid in monthly interest only to keep the "farmers" in this ecosystem. Even a surface-deep reading of the project documentation makes one think before investing whether a 20% return on investment is possible during the economic slowdown since bank deposits offer 3–5%. The analysis of the statements of private investors leads to the conclusion that many of them – tempted by the vision of a quick profit – very unreasonably invested their funds in, in fact, extremely risky financial instruments, either not understanding what they were investing in or doing it because they were hoping for an even greater profit and cashing out before the collapse.

6. Potential criminal liability under Polish law

One should be cautious in making any judgments about the possible and, of course, purely hypothetical, criminal liability of the creators of this system under the Polish Criminal Code (hereinafter the PCC).

First, it is necessary to consider what is the object of a crime, which would enable its criminal law evaluation, and then analyze the possibility of such a recognition of the act, so that it would allow the behavior to be evaluated as exhibiting the features of a specific type of a prohibited act. In other words, the key is to answer the question of whether Polish criminal law is ready for the challenges posed by a criminal law evaluation of behavior pertaining to dematerialized assets that are stablecoins or tokens in DeFi systems.

A situation in which an economic entity encourages investing in a "stable" virtual currency, conducting an aggressive marketing campaign in the media, and offering a high return on invested funds, may intuitively evoke the Amber Gold[35] case, which ended with a conviction for fraud only in May 2022.[36] However, the differences between these cases are of fundamental importance for the possibility of qualifying such behavior as fraud, i.e. a crime criminalized in Art. 286 § 1 of the PCC.

32 K. Everington, *Taiwanese man commits suicide after losing nearly NT$60 million from Luna crypto crash* (2022), https://perma.cc/KF4V-ELXZ (access: 02.06.2024).

33 See more K. Saengchote, *A DeFi Bank Run: Iron Finance, IRON Stablecoin, and the Fall of TITAN* (2021), https://ssrn.com/abstract=3888089 (access: 02.06.2024).

34 A Twitter user known as Sensei Algod bet $ 1 million against Do Kwon in March 2022 that the LUN price on March 14, 2023, would be lower than $ 88. On July 11, 2022, the price of the Luna LUNC is $ 0.0001. Algod [@AlgodTrading], Tweet, (2022, March 13), https://twitter.com/AlgodTrading/status/1503103705939423234 (access: 02.06.2024).

35 This financial pyramid was founded in 2009 encouraging investments in gold and precious metals. It lured investors with high-interest rates on deposits – up to 16.5% per year – which significantly exceeded the interest rate on bank deposits. It collapsed in 2012, causing nearly 20,000 persons to make an unfavorable disposal of property in the amount of almost 851 million PLN (approx. 200 million USD).

36 The final decision was made only on May 30, 2022, after almost 10 years.

More than one monograph and hundreds of articles have been devoted to the analysis of such features. Therefore, not wanting to make a commentary on the provision in question, this study emphasizes only those aspects which, in the author's opinion, would make it impossible to make such a criminal law qualification in the discussed case. It is worth noting that this analysis was made on the basis of incomplete factual information available at this stage only from press reports and statements of representatives of state authorities, especially in South Korea.

The provision of Art. 286 § 1 of the PCC defines punishable behavior as inducing an unfavorable disposition of property through misrepresentation or by exploiting a mistake or exploiting the inability to properly understand the action taken. However, it cannot be ignored that, unlike a typical financial pyramid, the interest on the stacked funds was not paid directly from the payments of subsequent customers, but from loans granted to other users of the network. So, they were in fact a kind of shadow bank. Obviously, as mentioned above, at the time of the enormous popularity of the system, funds obtained from borrowers did not meet the promised rates of return on capital. However, the creators of the system presented it as a necessary cost to gain a dominant position in the world of stablecoins.[37] The liquidity of the entire system and the maintenance of the peg at the 1:1 ratio were intended to be secured by accumulated in 2022 BTC, the value of which exceeded several USD billion. These BTC holdings were ultimately liquidated by the LFG in order to save the UST relationship to USD.

It should be remembered that the hallmarks of a fraudulent offense are not borne by such behavior, which, although it results in the loss of capital entrusted with a manager, is not inextricably linked with it, and is not characterized by the *mens rea* required by law. Objective elements of fraud must be reflected in the awareness of the perpetrator and must be included in their will. The perpetrator must not only want to obtain financial gain but also want to use a specific method for this purpose. The characteristics of the *mens rea* of fraud are not met in a situation where any of the above-mentioned elements is not covered by the perpetrator's awareness.

The requirement of a specific *mens rea* of fraud is not met both when one of the elements of behavior is not reflected in the perpetrator's awareness and when the perpetrator does not want the elements to happen but only accepts it?[38] Fraud, from the point of view of the characteristics of mens rea, can be committed only with a direct intent, especially a specific intent (*dolus coloratus*), covering both the aim and the manner of the perpetrator's action.[39] Therefore, in order to accept the case at hand as an offense under Art. 286 § 1 of the PCC, the court should – by analyzing the *mens rea* – demonstrate, on the one hand, that the perpetrator's direct and directional intention was not only to mislead or exploit a mistake (as to how the Terra ecosystem or the Anchor protocol works), but also to act with a view to gaining a material benefit, and, on the other hand, that at the time of the act aimed at obtaining such a benefit the perpetrator's direct and specific intent covered the fact that the person disposing of property did so in a manner disadvantageous to himself.[40]

It seems that in the case of Terra, it is impossible to reach such a conclusion. However, it cannot be ignored that, unlike in the case of Amber Gold, the funds invested by clients were not managed by Do Kwon or TerraLab but were blocked on available and explicit smart contracts. The entire system was decentralized, and therefore deprived of the real possibility of using these funds by anyone other than their owners, who

37 However, this is not an isolated case of additional payments for the services offered in order to win the market with the expectation of future profits. Uber operated in such a model, which only in the third quarter of 2021 generated the first operating profit (EBITDA) in 10 years since its establishment (at the same time, in 2020 alone, the company recorded a loss of over 620 million USD).

38 See judgments of the Polish Supreme Court of July 19, 2007, V KK 384/06, LEX/el., No. 299205, as well as of April 3, 2007, III KK 362/06, LEX/el., No. 296749.

39 See judgments of the Polish Supreme Court of November 22, 1973, III KR 278/73, LEX/el., No. 16823; of July 19, 2007, V KK 384/06, LEX/el., No. 299205.; of April 3, 2007, III KK 362/06, LEX/el., No. LEX nr 296749.

40 See the judgment of the Polish Supreme Court of November 6, 2003, II KK 9/03, LEX/el., No. 83773.

could close their positions at any time (this obviously meant charging some fees). Obviously, this is irrelevant to the fulfillment of statutory elements of fraud, but it allows us to look at the aspect of the perpetrator's actual intent more clearly.

It is plain to see that all data on the model in which USDT, Luna and finally Anchor operated were available to everyone and fully reflected the facts. It is impossible to draw an analogy with the case of, for example, Amber Gold, in which investors tempted by profit were misled about the realization of the investment (in fact fictitious) in precious metals, and the Terra ecosystem, where funds were blocked in smart contracts for the needs of LP. Of course, this does not mean that it is not possible to create a financial pyramid using virtual currencies, the DeFi protocol, or the so-called high-yield investment program (HYIP). An example of such a pyramid is Plus Token, responsible for losses exceeding USD 3 billion.[41]

However, the main reason why such behavior cannot be considered fraud is the problem of interpretation of the concept of property and the impossibility of recognizing virtual currency, including stablecoin (especially in a decentralized system) under the current provisions of the PCC, as property. The analysis of the way the concept of property is understood by the Polish literature and jurisprudence on the basis of the applicable regulations shows[42] that it is uniformly assumed that the concept of property as a protected value covers the so-called broad scope of the term 'property', including all property, real and obligation rights, including services, profits, and proceeds constituting property.[43]

Therefore, a question should be asked about the understanding of the term 'property' under the Polish Civil Code (hereinafter the PCivilC). The answer to this question can be found in a resolution of the Polish Supreme Court of June 26th.[44] The Supreme Court stated in it that "the concept of property covers only property rights (property and other such[45]), that is, assets vested in a specific entity (...). Hence, the rights which are not of a civil law character, or which are civil rights but not of a property character remain outside the scope of Art. 44 of the PCivilC so they do not constitute property. (...) As for the crimes included in

The potential criminal liability of TerraUSD's creators under Polish law is clouded by legal ambiguities, particularly regarding the classification of virtual currencies as property.

41 M. Gu, *Plus, Token (PLUS) Scam – Anatomy of a Ponzi* (2022), https://perma.cc/PT6K-HZ3V (access: 02.06.2024).

42 A detailed analysis can be found in Behan, *Waluty*, 594 *et seq.*

43 M. Dąbrowska-Kardas, P. Kardas, "Art. 286", in *Kodeks karny. Część szczególna* (The Penal Code: Special Part), vol. 3, W. Wróbel, A. Zoll eds. (Wolter Kluwer, 2022), par. 11, 293; O. Górniok, D. Pleńska, "Przestępstwa przeciwko mieniu" („Crimes Against Property"), in *System prawa karnego. O przestępstwach w szczególności* (The System of Criminal Law. About Crimes in Particular), I. Andrejew, L. Kubicki, J. Waszczyński eds. (Zakład Narodowy im. Ossolińskich: 1989), 364; O. Chybiński et al., *Prawo karne: część szczególna, zagadnienia wybrane* (Criminal Law: Special Section, Selected Issues) (PWN, 1965), 252 *et seq.*; Judgement of the Voivodeship Administrative Court in Bydgoszcz of April 15, 2009, I SA/Bd 108/09, LEX/el., No. 549445.

44 See the judgment of the Polish Supreme Court of June 26, 2014, I KZP 8/14, OSNKW 2014, No. 10, item 74.

45 The category of property rights includes ownership, perpetual usufruct, intangible property rights (the so-called intellectual property rights), and the expectation of acquiring subjective rights.

Chapter XXXV of the Criminal Code, there is no doubt that the generic subject of protection is property, which subsumes? ownership and other property rights (Art. 44 of the PCivilC), i.e. both real and obligation rights."

The view that virtual currencies do not fall within the current scope of the concept of property rights under Art. 44 of the PCivilC does not raise any major doubts.[46] This must lead to a conclusion that is difficult to accept axiologically, which is that cryptocurrency holders are deprived of effective criminal law protection. However, taking into account the guarantee functions of criminal law, it is impossible to see a virtual currency as property under criminal law solely by using analogies with civil law (and the statement that the rules of interpretation of civil law allow for the extension of this concept), ignoring the opposing views articulated in the civil law literature, the heterogeneity of the virtual currencies systems themselves, and the fact that the concepts of property and property rights are distinguished from virtual currencies under the Polish? Act on combating money laundering and financing terrorism,[47] which introduced the concept of a virtual currency into the Polish legal system, otherwise implementing the provisions of AML V.[48] Unlike the Amber Gold case (where the unfavorable disposition concerned property in the form of cash or funds accumulated in a bank account, which were transferred to the bank account of that entity, which undoubtedly fell within the concept of property), in the case of the Terra system, virtual currencies were exchanged e.g. for USDT or Luna. Of course, many of them first had to convert the funds accumulated in their accounts on the exchange platform of their choice, but in the end, the system relied solely on funds represented in virtual currencies and accepted only such funds. This creates an obvious system loophole in the PCC, that should not exist due to the enormous risk for investors. However, making it watertight requires amendments to the code provisions, because the analogy with civil law cannot be applied in criminal law.

Therefore, the current wording of the provisions prohibits bringing the charges of fraud due to the behavior failing to meet the characteristics of fraud, but in this particular case it would be extremely difficult also due to serious doubts as to the direct intent in its particular form which is a statutory requirement to establish a case of fraud, that is a specific intent. At the same time, the fact that after many years of criminal proceedings, the creator of such a system will receive a penalty of deprivation of liberty, even in the most severe conditions, is of little consolation to hundreds of thousands of people who have often lost their life savings after entrusting them to such instruments. The issue of potential criminal liability for the creators of such a system is of little consequence when considering the security and certainty of the financial system, as well as the prevention of future incidents of this kind.

7. Impact of EU regulations on the scope of criminality

Prior to 2022, the EU's legislative efforts pertaining to the crypto-asset sector (including Stablecoin) had focused mainly on the regulation of AML/CTF aspects. The scale of the danger that materialized in the collapse of Terra/Luna, Celsius, or FTX, and the desire to control the financial risks or risks to market integrity that result from the huge capitalization of the entire sector led to the intensification of work on MICAR (Markets in Crypto-Asset Regulation).[49] It is an attempt to regulate the stablecoin market in a complementary way, by introducing a uniform EU legal framework for entities offering them? It seemed necessary to regulate such a significant sector as crypto-

46 See the discussion in Behan, *Waluty*, 532 *et seq.* and the literature cited therein.

47 Ustawa z dnia 1 marca 2018 r. o przeciwdziałaniu praniu pieniędzy oraz finansowaniu terroryzmu (Law of March 1, 2018 on the Prevention of Money Laundering and Financing of Terrorism) (Polish Journal of Laws of 2020, item 971, uniform text, as amended).

48 Directive (EU) 2018/843 of the European Parliament and of the Council of 30 May 2018 amending Directive (EU) 2015/849 on the prevention of the use of the financial system for the purposes of money laundering or terrorist financing, and amending Directives 2009/138/EC and 2013/36/EU (Official Journal L 156 of 2018, 43–74).

49 Regulation (EU) 2023/1114 of the European Parliament and of the Council of 31 May 2023 on markets in crypto-assets, and amending Regulations (EU) No 1093/2010 and (EU) No 1095/2010 and Directives 2013/36/EU and (EU) 2019/1937 (Official Journal L 150 of 2023, 40–205).

assets, especially since the aim of the regulation was to ensure legal certainty, promote innovation, ensure an adequate level of consumer and investor protection, and ensure the financial stability of the entire sector, i.e. all those aspects that have been strained by the fall of Terra/Luna.

MICAR entered into force on June 29, 2023,[50] and applies to all legal persons who want to issue crypto-assets or provide services related to crypto-assets in the EU.

It replaces the definition of virtual currency from AML Directive V with a far broader concept of crypto-assets meaning "digital representation of value or rights which may be transferred and stored electronically, using distributed ledger technology or similar technology", and groups crypto-assets into three main categories: asset-referenced tokens[51] ("ART"), e-money tokens[52] ("EMT"), and "other" crypto-assets.

Although both categories (ART and EMT) define the types of stablecoin (as indicated by the goal of "maintaining stable value"), the key, from the point of view of the discussion offered in this paper, is obviously ART,[53] and the answer to the question of whether, under MICAR – the act that was supposed to regulate the stablecoin market, a system analogous to TerraUSD will be included in this asset category. In the context of criminal law considerations, the definition and status of algorithmic stablecoins and therefore the possibility of qualifying them as, for example, things, funds, or money, as well as the scope of obligations imposed on stablecoin issuers, failure to comply with which may be a circumstance indicative of the perpetrators' intent, appear to be crucial.

And there are very detailed and numerous requirements related to the process of offering ART and EMT, starting with the need to obtain authorization from the competent authorities for the issue of such tokens itself (Article 19), preceded by the submission of a very extensive application (Article 16), including a detailed white paper[54] on crypto-assets (Article 17) and many more.

For the avoidance of doubt as to the status of algorithmic stablecoins under MiCAR, Recital (41) states "Where a crypto-asset falls within the definition of an asset-referenced token or e-money token, Title III or IV of this Regulation should apply, irrespective of how the issuer intends to design the crypto-asset, including the mechanism for maintaining a stable value of the crypto-asset. The same applies to so-called algorithmic 'stablecoins' that aim to maintain a stable value in relation to an official currency, or in relation to one or several assets, via protocols, which provide for the increase or decrease in the supply of such crypto-assets in response to changes in demand. Offerors or persons seeking admission to trading of algorithmic crypto-assets that do not aim to stabilize the value of the crypto-assets by referencing one or several assets should, in any event, comply with Title II of this Regulation." This is a fundamental change from the first versions of the draft, in light of which, "So-called algorithmic 'stablecoins' 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 should not be considered as asset-referenced tokens, provided that they

50 According to the wording of Article 149, although MICAR entered into force on June 29, 2023 (20 days after its publication in the Official Journal of the European Union), only the regulations enumerated in Article 149(4) apply from that date. The ART and EMT regulations will enter into force on June 30, 2024, and the remaining regulations (including those relating to crypto-asset service providers) on December 30, 2024. This means that by the end of 2024, regulation of the sector will be very fragmented indeed.

51 The 'asset-referenced token' means a type of crypto-asset that is not an electronic money token and that purports to maintain a stable value by referencing another value or right or a combination thereof, including one or more official currencies.

52 The 'electronic money token' or 'e-money token' means a type of crypto-asset that purports to maintain a stable value by referencing the value of one official currency.

53 TerraUSD had no collateral in any fiat currency which eliminates the possibility of it being considered ART.

54 In the crypto world, these terms are also used to describe documents– *whitepaper*, which can be spoken of as a certain proposal aimed at encouraging users to use a certain technical solution, describes the problem and offers a solution, *yellow paper* – is a technical explanation of the details presented in the whitepaper, and *beige paper* – is a simplified version of yellow paper. When this act is offered, it acts as a kind of prospectus.

do not aim at stabilizing their value by referencing one or several other assets."

Unfortunately, the real possibility of making decentralized systems (DeFi) compulsory to comply with the legal framework imposed by any regulation is very often hindered by technical considerations and the extremely limited ability of authorities to potentially enforce them against the creators. Sometimes due to the inability to determine the identity of the creator of the algorithm or smart contract itself (to this day, after all those years, we still do not know who Satoshi Nakamoto– the creator of Bitcoin – was), but very often due to the fact that very often crypto-asset services are provided in a completely decentralized manner without the involvement of an intermediary.

The introduction of comprehensive EU regulations aims to harmonize legal standards across member states, enhancing the ability to prosecute fraudulent activities in decentralized financial systems.

This was at the root of Recital (22), which indicates that "This Regulation should apply to natural and legal persons and certain other undertakings and to the crypto-asset services and activities performed, provided or controlled, directly or indirectly, by them, including when part of such activities or services is performed in a decentralized manner. Where crypto-asset services are provided in a fully decentralized manner without any intermediary, they should not fall within the scope of this Regulation" (emphasis mine). The model in which TerraUSD operated was a fully decentralized model (despite the fact that the entity that placed this smart contract in the blockchain was known).

Doubts about the shape of these regulations were also raised in a study[55] commissioned by the European Parliament, which pointed out that MiCAR, already from the moment of its enactment, does not address a number of challenges facing the regulation of the sector. As an example – the lack of clear criteria for distinguishing between "partially decentralized" services (which are within the scope of MiCAR) and those provided "in a fully decentralized manner without intermediaries" (outside the scope of MiCAR). Where the line is drawn between these concepts, which are key to the act's obligations, will be determined in future implementing regulations. It is clear that each bidder will claim that its service operates in a completely decentralized manner, which, given the wide spectrum of IT models used, will require very clear and detailed regulations, and is particularly problematic in the case of criminal law regulations, where the principle of *in dubio pro reo* operates.

Aside from the above concerns, it should be noted that in the current EU regulations on the decentralized stablecoin market, Terr/Luna system bypassed all the requirements and limitations related to the need to meet the requirements of KYC and CTF/AML, allowing for pseudo-anonymous[56] investment of funds of any origin and by? any person without the supervision of any institution, above all without the potential risk that the managing entity of such a system may appre-

55 D. Zetzsche et al, *Remaining regulatory challenges in digital finance and crypto-assets after MiCA, publication for the Committee on Economic and Monetary Affairs (ECON), Policy Department for Economic, Scientific and Quality of Life Policies, European Parliament*, (STUDY Requested by the ECON Committee: 2023), https://perma.cc/F6B2-5A8B (access: 27.05.2024).

56 See also considerations on the anonymity of virtual currency systems presented in Behan, *Waluty*, 249 ff.

hend these funds at the request of e.g. some governmental services because there is no such managing entity which has access to funds in the case of such a system. Of course, the "primary" acquisition of virtual currencies, which allowed the use of the system, should take place, according to Hughes,[57] through the so-called "gatekeepers" who are most likely obliged entities. However, it is not difficult to imagine people who had already had crypto-assets before solutions imposing KYC in individual countries came into force or made exchanges in countries where FATF recommendations have not yet been implemented.

It is also necessary, in light of the DLT Pilot Regime,[58] to make one more attempt to qualify TerraUSD into a legal framework that would allow for a criminal law response against its creators. The impetus for this is provided by Article 18 of this act. It responds to the key problem of the inadequacy of the conceptual grid of financial instruments to the cryptocurrency sector, as presented in Recital No. 59. It aptly points out that: "At present, the definition of financial instrument in Directive 2014/65/EU does not explicitly include financial instruments issued by means of a class of technologies that supports the distributed recording of encrypted data, namely, distributed ledger technology. In order to ensure that such financial instruments can be traded on the market under the existing legal framework, the definition of financial instruments in Directive 2014/65/EU should be amended to include them."

Article 18(1) of the DLT Regulation amends Article 4(1)(15) of Directive 2014/65/EU, which defines the term financial instrument, to read: (15)

"'financial instrument' means those instruments specified in Section C of Annex I, including such instruments issued by means of distributed ledger technology."

The regulations of these two acts, in fact, shape two independent legal regimes for crypto-assets, which can be classified as a financial instrument under MiFID II, a crypto-asset under MiCAR, or outside the scope of both by being an unregulated crypto-asset. In the case of the Terra/Luna system, this will fall into the third of the categories.

Under the current law, it would not be possible either to bring charges of fraud against the creators of this system or people who – by advertising Terra and, for example, the possibility of using the Anchor protocol for profit – would encourage investment in such "instruments." The change in the definition of a financial instrument in MiFID II, implemented in March 2023 into the Polish legal system by virtue of the Law on Amendments to the Law on Investment Funds,[59] will make it possible to extend criminal law protection in the future, to at least some crypto-assets. Unfortunately, even if one assumes that the collapse occurred after this amendment came into force, it is difficult to consider TerraUSD as one of the financial instruments listed in SECTION C of MiFID II. Such a qualification would open up the possibility of criminally valuing a number of behaviors penalized under Polish criminal law, such as manipulation of a financial instrument. Unfortunately, the shape of CC regulations prevents recognition of crypto-assets even as "property", essentially leaves participants in the Terra/Luna system (or systems operating under an analogous model) outside of criminal law protection. Also, the Polish legal system does not recognize the institution of aiding behavior that does not constitute a crime. If, at the same time, it was considered that such behavior would encourage

57 S.J. Hughes, "Gatekeepers" Are Vital Participants in Anti-Money-Laundering Laws and Enforcement Regimes as Permission-less Blockchain-Based Transactions Pose Challenges to Current Means to „Follow the Money", *George Mason University Legal Studies Research Paper* 408 (2019), https://perma.cc/8WB9-CJRB (access: 02.06.2024).

58 Regulation (EU) 2022/858 of the European Parliament and of the Council of 30 May 2022 on a pilot regime for market infrastructures based on distributed ledger technology, and amending Regulations (EU) No 600/2014 and (EU) No 909/2014 and Directive 2014/65/EU (Official Journal L 151 of 2022, 1–33).

59 Ustawa z dnia 14 kwietnia 2023 r. o zmianie ustawy o funduszach inwestycyjnych i zarządzaniu alternatywnymi funduszami inwestycyjnymi, ustawy o obligacjach, ustawy o Bankowym Funduszu Gwarancyjnym, systemie gwarantowania depozytów oraz przymusowej restrukturyzacji oraz niektórych innych ustaw (Act of April 14, 2023 on amending the Act on Investment Funds and Management of Alternative Investment Funds, the Act on Bonds, the Act on the Bank Guarantee Fund, the Deposit Guarantee System and Forced Restructuring, and Certain Other Acts) (Journal of Laws of 2023, item 825).

new participants to invest capital so that the current users could receive their profits, then it should be stated that it is not possible to evaluate that as aiding the commission of a prohibited act to an unspecified circle of people, i.e. aiding *ad incertam personam*.

The foregoing discussion and the conclusions reached are not related to the imperfection of only the Polish or EU legal systems. Similar doubts and attempts to address such situations appeared in many countries after the fall of Terra. It is obvious that the loss of billions of dollars by hundreds of thousands of people around the world must have triggered a reaction from the state authorities. However, they were extremely limited in their impact due to the analogous lack of effective legal solutions and the impossibility of applying an extended interpretation, especially in the area of criminal law.

Of course, the key here would be to prove the intention of committing fraud, but carelessness or reckless business decisions do not constitute? fraud. Following the collapse of Terra, the UK Treasury Department reaffirmed its commitment to regulating stablecoins[60] as the regulation of stablecoins that are used as a means of payment will be part of the Financial Services and Markets Bill. South Korea considered a "fallback test" for cryptocurrencies, and on May 30, 2023 South Korea's National Assembly approved a Virtual Asset User Protection Act, the country's first legal framework of digital assets. US Treasury Secretary Janet Yellen referred to the USDT collapse saying: "I think that simply illustrates that this is a rapidly growing product and that there are risks to financial stability, and we need a framework that's appropriate." She added that it would be highly appropriate for such regulations to appear this year, but it was not until mid-2023 that the bipartisan bill Crypto-asset National Security Enhancement Act of 2023[61] was filed in the US Senate. According to the briefing document, the bill aims "to combat the rise in crypto-facilitated crime and close off avenues for the evasion of money laundering and sanctions measures that are critical to our national security." The draft contains many difficult-to-implement (on the technical side) obligations on "anyone who 'controls' a DeFi protocol or makes available an application to use a DeFi protocol." It does, however, contain an interesting idea touting fully decentralized services such as the Terra/Luna service under consideration in this paper. According to the bill's briefing document, "if nobody controls a DeFi protocol anyone who invests more than $25 million in developing the protocol will be responsible for these obligations." This would make it impossible for entities that have invested in the development of a particular DeFi service and are indirectly earning money from it, to claim that due to their lack of control over the smart contract in question and its fully decentralized nature, they are not liable for investors' potential losses.

8. Conclusions

The wording of The Polish Criminal Code and the impossibility of recognizing virtual currency, including stablecoin (especially in a decentralized system) under the current provisions of the PCC, as property, on the one hand, and the extremely limited possibility of recognizing current DeFi instruments as financial instruments under MiFID II, on the other, creates an especially important gap in terms of legal protection in Poland. At the same time, closing this gap seems relatively simple. Supplementing the definition of "movable item" contained in the glossary of statutory expressions with "virtual assets" would not only allow the taking for the purpose of misappropriation of funds accumulated in a bank account to be treated on a par with the "taking" of units of virtual currencies but also – as a consequence – would close the loophole that prevents the forfeiture of virtual currencies under the current legislation. As a result, this change would open the way to qualifying virtual currencies

60 Plans were announced by Queen Elizabeth II (Speech 2022), https://www.gov.uk/government/speeches/queens-speech-2022 (access: 02.06.2024) and confirmed by J. Titcomb, *Rishi Sunak to legalise 'stablecoins' despite cryptocurrency crash* (2022), https://perma.cc/ZR2E-SCBL (access: 02.06.2024).

61 S.2355 – A bill to clarify the applicability of sanctions and antimoney laundering compliance obligations to United States persons in the decentralized finance technology sector and virtual currency kiosk operators, and for other purposes. See https://www.congress.gov/bill/118th-congress/senate-bill/2355/text?s=3&r=1 (access: 27.05.2024).

as property, which, in turn, would make it possible to include in the scope of criminalization even the crime of fraud against virtual assets.

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