Bestuur
E-ISSN 2722-4708 | P-ISSN 2302-3783
Vol.11, No.1, August 2023, pp. 1-25

Cryptocurrency: Highlighting the Approach, Regulations, and Protection in Indonesia and European Union

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ARTICLE INFO

Article history
Received: November 9, 2022
Revised: February 28, 2023
Accepted: April 8, 2023

Keywords
Indonesia;
Regulation;
Blockchain;
Cryptocurrency;
Bitcoin;

ABSTRACT

The speed of the adoption and use of cryptocurrency that utilizes blockchain technology as its central infrastructure is expanding globally, including in Indonesia. It has promising prospects as a future asset and payment instrument. However, the regulations in Indonesia are often delayed and inadequate for dealing with cryptocurrency's developments. This research is intended to analyze the approaches, regulations, and protection of the use of cryptocurrency. This study argues that the regulatory approach to using cryptocurrency is balanced, while Indonesia has a partial status in cryptocurrency legality. The government's protection of cryptocurrency investors is adequate in using cryptocurrency as a commodity traded on futures exchanges with a license from *Bappebti*. A progressive policy for establishing the Digital Asset Law by the government is important due to the resultant clarity in the regulatory status of cryptocurrency will allow the ecosystem to grow and promote innovation, thus harnessing the benefits of cryptocurrency while mitigating related risks.

1. Introduction

The development and adoption of blockchain and cryptocurrency technology are virtually unstoppable. As an emerging information technology, blockchain has aroused extensive discussions around the world and has been suggested as a solution to current issues in the finance industry.[1] Blockchain originates from the idea that digital data can be stored and transmitted securely without the risk of hacking or manipulation due to its decentralized nature.[2] Blockchain technology is a new technological innovation that

[1]Yutong Bai, Yang Liu, and Wee Meng Yeo, 'Supply Chain Finance: What Are The Challenges in The Adoption of Blockchain Technology?', *Journal of Digital Economy*, 1.3 (2022), 153–65 https://doi.org/10.1016/j.jdec.2022.12.002
[2]Rahmayati, 'Strengthening Islamic Banking Services in Indonesia Through Blockchain Technology: The Anp-Step Approach', *At-Tijaroh: Jurnal Ilmu Manajemen dan Bisnis Islam*, 7.2 (2021), 259–72 https://doi.org/10.24952/tijaroh.v6i2.2453

triggers the birth of digital money or cryptocurrency that can be utilized in various fields of life. The speed of adoption and use of cryptocurrency that utilize blockchain technology as their primary infrastructure is expanding globally, including in Indonesia, and has promising prospects as future assets and payment instruments. Technology influences various aspects of life, including social, cultural, economic, and business. In short, it is undeniable that information technology has been implemented in every line of human life, from government administration to economic issues.[3]

Cryptocurrency (as well as its adoption, practical applications, technology, and security) is a popular new topic that is still being studied. Cryptocurrency has attracted widespread attention from many parties, especially investors, researchers, financial institutions, and policymakers.[4] After bitcoin was introduced worldwide during the post-economic crisis in 2008 by a person under the pseudonym Satoshi Nakamoto, many cryptocurrencies were created following the bitcoin smart contract standard.[5] A smart contract is usually defined as a program implemented in low-level code scripts running on blockchain platforms and executed automatically by connected computers (nodes) on the network.[6] The primary purpose of bitcoin was to eliminate the need for a central controller, thus allowing the entire financial system to be controlled through a peer-to-peer electronic money system. This peer-to-peer system allows online transactions to be sent directly from one party to another without going through a financial institution (decentralized digital payments system).[7]

Cryptocurrency involves a database regulated by a blockchain that is commonly used as a virtual currency that has benefits and drawbacks. One of the key benefits of using cryptocurrency is that it is efficient in terms of time and energy because it can be done using computers or other suitable digital devices without requiring third parties.[8] Another key benefit of this technology is that peer-to-peer transactions are recorded on a cryptocurrency network. Users of bitcoin and altcoins (cryptocurrencies that are not bitcoin) often assume almost no risk because they do not suffer the losses from inflation or currency counterfeiting that are associated with printed money (fiat money). However,

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[3]Alnoor Bhimani, Kjell Hausken, and Sameen Arif, 'Do National Development Factors Affect Cryptocurrency Adoption?', *Technological Forecasting and Social Change*, 181.August 2021 (2022), 121739 https://doi.org/10.1016/j.techfore.2022.121739

[4]Nektarios Aslanidis, Aurelio F. Bariviera, and López Óscar G., 'The Link between Cryptocurrencies and Google Trends Attention', *Finance Research Letters*, 47.102654 (2022), 1–8 https://doi.org/10.1016/j.frl.2021.102654

[5]Juan Pi˜neiro-Chousa and others, 'A Preliminary Assessment of The Performance of DeFi Cryptocurrencies in Relation to Other Financial Assets, Volatility, and User-Generated Content', *Technological Forecasting & Social Change*, 181.121740 (2022), 1–8 https://doi.org/10.1016/j.techfore.2022.121740

[6]Alkhansaa A. Abuhashim and Chiu C. Tan, 'Improving Smart Contract Search by Semantic and Structural Clustering for Source Codes', *Blockchain: Research and Applications*, 2022, 1–20 https://doi.org/10.1016/j.bcra.2022.100117

[7]Paraskevi Katsiampa, Larisa Yarovaya, and Damian Zięba, 'High-Frequency Connectedness between Bitcoin and Other Top-Traded Crypto Assets during The COVID-19 Crisis', *Journal of International Financial Markets, Institutions & Money*, 79.101578 (2022), 1–29 https://doi.org/10.1016/j.intfin.2022.101578

[8]Yolanda Adelia Bella Lestari Sam, Messy Rachel Mariana Hutapea, and Suyudi Setiawan, 'Legalitas Cryptocurrency Dalam Tindak Pidana Kejahatan Pencucian Uang', *DiH: Jurnal Ilmu Hukum*, 18.1 (2022), 108–20 https://doi.org/10.30996/dih.v0i0

cryptocurrencies such as bitcoin do not have underlying assets and are not regulated by the Financial Services Authority in Indonesia, so their security is not guaranteed.[9]

According to data on *Coinmarketcap* (2022), which is a popular aggregator of cryptocurrency data, there are currently more than 21,600 cryptocurrencies, including stablecoins and tokens, and there are over 500 cryptocurrency exchanges worldwide. The five major cryptocurrencies are Bitcoin, BNB, Cardano, Ethereum, and XRP.[10] As Bitcoin is the largest cryptocurrency, with a market dominance of well over 50% since its inception, it is likely that investors place a large proportion of their cryptocurrency portfolio in bitcoin and the rest into altcoins.[11] In the Indonesian context, of the 21,600 cryptocurrencies above, only 383 crypto assets can be traded on the physical crypto asset market (exchanges). This clause is regulated in the Commodity Futures Trading Regulatory Agency (CoFTRA, *Bappepti* in *Bahasa Indonesia*) Regulation Number 11 of 2022 concerning the Establishment of a List of Crypto Assets Traded in the Physical Crypto Asset Market, which was promulgated on August 8, 2022.

Indonesia has one of the largest populations of internet users in the world. Based on Databoks' presentation, 204.7 million internet users resided in Indonesia as of January 2022. This number increased by 1.03% compared to the previous year. In January 2021, the number of internet users in Indonesia was 202.6 million. Meanwhile, the internet penetration rate in Indonesia reached 73.7% of the total population by the beginning of 2022. It was recorded that the total population of Indonesia was 277.7 million people in January 2022.[12] The large number of internet users in the country allows the intensity of digital transactions that have used cryptocurrency. In this regard, based on the Press Release of the Public Relations Bureau of CoFTRA dated July 27, 2022, the number of cryptocurrency investors in Indonesia as of June 2022 was 15.1 million. This figure exceeds the number of investors in the capital market, mutual funds, and state securities. The rapid growth in the number of crypto asset investors is in line with the increase in the value of their investments, which reached IDR 859.4 trillion in 2021, up 1.222% from the previous year.

Investments can be direct or indirect, as well as short- or long-term, and are made with the expectation of gaining a profit or other benefits. The characteristics of cryptocurrency are significantly different from those of traditional securities. Cryptocurrency is an unregulated, decentralized, peer-to-peer transaction enabling users to process transactions through digital units of exchange.[13] Cryptocurrency attracts many investors throughout Indonesia. Some reasons for the popularity of crypto assets include increasing prices,

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[9]Hardian Satria Jati and Ahmad Arif Zulfikar, 'Transaksi Cryptocurrency Perspektif Hukum Ekonomi Syariah', *Jurnal Al-Adalah : Jurnal Hukum Dan Politik Islam*, 6.2 (2021), 137–48 https://doi.org/10.35673/ajmpi.v6i2.1616

[10]Leonardo H.S. Fernandes and others, 'The Resilience of Cryptocurrency Market Efficiency to COVID-19 Shock', *Physica A*, 607.128218 (2022), 1–8 https://doi.org/10.1016/j.physa.2022.128218

[11]Yi Li, Brian Lucey, and Andrew Urquhart, 'Can Altcoins Act as Hedges or Safe-Havens for Bitcoin?', *Finance Research Letters*, 103360, 2022, 1–6 https://doi.org/10.1016/j.frl.2022.103360

[12]Cindy Mutia Annur, 'Jumlah Pengguna Internet Di Indonesia (2018-2022*)', *Ada 204,7 Juta Pengguna Internet Di Indonesia Awal 2022*, 2022 <https://databoks.katadata.co.id/datapublish/2022/03/23/ada-2047-juta-pengguna-internet-di-indonesia-awal-2022> [accessed 7 December 2022].

[13]Dirk F. Gerritsen, Rick A.C. Lugtigheid, and Thomas Walther, 'Can Bitcoin Investors Profit from Predictions by Crypto Experts?', *Finance Research Letters*, 46.102266 (2022), 1–7 https://doi.org/10.1016/j.frl.2021.102266

blockchain technology support, and legal certainty. Cryptocurrency transactions or trades in Indonesia are legal and supervised by CoFTRA, the Ministry of Trade. Since cryptocurrency is considered a digital commodity, it is seen as a commodity with a futures contract but not as a means of payment. In this context, cryptocurrency should be seen as an investment tool rather than a method of exchange.[14]

Although cryptocurrency transactions or trades provide several advantages for their users, including significantly high returns on investment, they are prone to market price volatility and high risks, such as scams and market manipulation. Simply put, cryptocurrency trading is subject to high market risk. In light of this, it is worth mentioning some of the tragedies that befell cryptocurrency in 2022, including the case of Terra (Luna) and UST coins, which experienced a death spiral, causing many traders and investors, even venture capitalists, to suffer substantial losses. Examples of other tragedies include the bankruptcy of the Celsius exchange and the liquidation of the Singapore-based crypto hedge fund, Three Arrows Capital. The price of Terra (Luna) dropped by more than 99%, from USD 120 (about IRP 1,700,000) to USD 0.15 (around IRP 2,000), in one day. These cases led to the collapse of the cryptocurrency market price, which stayed low for a long time (this period is referred to as the crypto winter).[15] Such a condition was exacerbated by the collapse of FTX (the fourth-largest crypto exchange in the world) in November 2022, which reduced public confidence in the cryptocurrency industry.

Prior to its collapse, UST was the fourth-largest stablecoin after Binance USD, USD Coin, and Tether. Due to the potential risks to financial stability posed by the failure of large stablecoins, relevant regulatory bodies, including the Financial Stability Board and the Bank of International Settlements, as well as governments such as those of Japan, Hong Kong, the United Kingdom, the European Union, and the United States, have proposed robust regulations for these digital assets.[16] More specifically, the systemic impact of the Terra case has caused the government of South Korea, where Terraform Labs' head office is based, to plan to form a particular institution called the Digital Assets Committee. This move is in line with moves made by the United States and several European Union countries to accept and acknowledge the existence of cryptocurrency and other digital assets, and legal certainty is needed to deal with this new investment class.[17]

This move is even more critical considering the global attention given to the war in Ukraine, which has brought international public attention to cryptocurrency. Added to the purported connections of cryptocurrency to illegal activities and the alleged links between oligarchs and criminal financial activities are the imposition of European Union sanctions, tightened prohibitions on crypto assets, and transactions against Russia.[18] Basically, in the

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[14]Syed Ali Raza and others, 'Uncertainty in The Financial Regulation Policy and The Boom of Cryptocurrencies', *Finance Research Letters*, 52.103515 (2023), 1–6 https://doi.org/10.1016/j.frl.2022.103515

[15]'Mereka yang Tumbang di Kiamat Crypto 2022. Who's Next?', dir. by Angga Andinata, *Angga Andinata* (Youtube, 2022) https://www.youtube.com/watch?v=eoytkGX4sXU

[16]Antonio Briola and others, 'Anatomy of a Stablecoin's Failure: The Terra-Luna Case', *Finance Research Letters*, 51.103358 (2023), 1–13 https://doi.org/10.1016/j.frl.2022.103358

[17] Danny Park, 'South Korea's All-Encompassing Crypto Law Is Coming — What We Know So Far', 2022 <https://forkast.news/south-korea-crypto-law-what-we-know-so-far/> [accessed 7 December 2022].

[18]Rabeh Khalfaoui, Giray Gozgor, and John W. Goodell, 'Impact of Russia-Ukraine War Attention on Cryptocurrency: Evidence from Quantile Dependence Analysis', *Finance Research Letters*, 103365, 2022 https://doi.org/10.1016/j.frl.2022.103365

global context and in Indonesia, there is a gap in the regulation of cryptocurrency, which contributes to legal uncertainty and weak investor protection, as well as fraud and illicit activities.

In the Indonesian context, regarding the tragedies that befell cryptocurrency in 2022, the government's efforts to protect investors or users were insignificant compared to the actions taken by other countries, as mentioned above. In fact, with the number of cryptocurrency investors in Indonesia reaching 15.1 million as of June 2022 and continuing to increase, many traders and investors have undoubtedly suffered heavy losses and could suffer significant losses in other cases in the future. In response to the cases of Terra and UST, Celsius, Three Arrows Capital, and (later) FTX coins, as previously described, the government limits only crypto assets that can be traded on the physical crypto asset market (exchanges) through CoFTRA Regulation No. 11 of 2022 concerning the Establishment of a List of Traded Crypto Assets in the Crypto Asset Physical Market. Of course, this policy instrument is not sufficient to protect cryptocurrency users.

The above discussion illustrates that Indonesia, as a digital society, continues to develop and compete with other countries, adapt to the development of cryptocurrency technology, and formulate appropriate arrangements for cryptocurrency in two main aspects, namely as a futures asset and as a means of payment. Such development is necessary, considering that the role of cryptocurrency in Indonesia is still not clear regarding the direction of regulations. Thus, several problems remain, especially regarding protection and legal arrangements, considering that cryptocurrency transactions have been taxed and could be used as a legal medium of exchange. However, laws and regulations in Indonesia are often delayed and inadequate in dealing with such conditions and developments.

This study intends to analyze the policy approaches, regulations, and protection related to the use of cryptocurrency in Indonesia. Such a study is necessary, considering that scientific publications on cryptocurrency from a legal perspective are still very scarce in Indonesia. Furthermore, a search of secondary legal materials indicates that there has been no comprehensive legal research on policy approaches and the regulation of the use of cryptocurrency in Indonesia. Therefore, this is a novel study whose results are expected to provide a new point of view or at least complement previous studies examining cryptocurrency from a legal perspective.

2. Results and Discussion

2.1. *Cryptocurrency Usage Policy Approach*

Cryptocurrency is the name used for a system in cryptography. The word "cryptocurrency" came from the science of cryptography, which is used to release data securely and to carry out the process of changing digital tokens in a scattered manner.[19] Cryptocurrency relies on the transmission of digital information using cryptographic methods to ensure the legitimacy of every transaction. Cryptocurrency overcomes the obstacles present in the deposit system that depend on a third party as a payment product issuing company that is trusted to manage digital transactions. In short, cryptocurrency is a virtual currency system that is not backed by a central bank or any government authorities,

[19] Alexey Mikhaylov, 'Cryptocurrency Market Analysis from the Open Innovation Perspective', *Journal of Open Innovation: Technology, Market, and Complexity*, 6.197 (2020), 1–19 https://doi.org/10.3390/joitmc6040197

and it functions like a standard currency that allows users to make payments virtually for business transactions without needing to pay service fees. At the same time, identity authentication no longer relies on a third-party centralized trust authority (decentralized structure).[20] The goal of cryptocurrency is to avoid dependence on financial institution authorities and central banks while reducing costs and increasing the security of transactions.[21]

Cryptocurrency markets continue to attract investors' interest on a global scale. Globally, more than 100 million people hold cryptocurrency, mostly as a speculative asset.[22] Since the launch of bitcoin, thousands of new cryptocurrencies have emerged with the intention of offering added value or other functionalities beyond being a commonly accepted medium of exchange, a store of value, or a unit of account.[23] Today, many people consider cryptocurrency a promising investment, especially in developing countries, including Indonesia. Cryptocurrency has two uses. It can be used as a payment method or currency, and it can be used as a commodity or a digital asset (commonly referred to as a crypto asset). Crypto assets are digital assets that take advantage of cryptocurrency technology, such as cryptographic technology, distributed ledgers, or blockchain. Cryptocurrency is immune to the old methods of government control and interference, and it has a flawless design and provides peer-to-peer and transparent transaction options. After people experience the benefits of cryptocurrency, they are unlikely to choose bank transactions over cryptocurrency transactions.[24]

Cryptocurrency has several advantages and disadvantages. However, in the context of this study, the following four advantages and disadvantages listed in Table 1 are the most relevant.

Table 1. Cryptocurrency's Advantages and Disadvantages

No.	Advantages	Disadvantages
1	The launch of cryptocurrency, such as Bitcoin, with a finite number of tokens, solves the problem of inflation due to the finite number of currencies, as is the case for fiat currencies.	Since cryptocurrencies are not considered legal tender, their volatility (high-value fluctuations) is a significant issue. Therefore, there is no assurance from the government because value is created on a speculative basis.
2	Most cryptocurrency transactions are peer-to-peer transactions without intermediaries, which	Cryptocurrency transactions are vulnerable to hacking, and because of the anonymous

[20]Zhixiu Yu, 'On the Coexistence of Cryptocurrency and Fiat Money', *Review of Economic Dynamics*, 2022, 1–34 https://doi.org/10.1016/j.red.2022.08.001
[21]John W. Goodell and others, 'Risk Substitution in Cryptocurrencies: Evidence from BRICS Announcements', *Emerging Markets Review*, 100938, 2022, 1–17 https://doi.org/10.1016/j.ememar.2022.100938
[22]Peter Howson and Alex de Vries, 'Preying on the Poor? Opportunities and Challenges for Tackling the Social and Environmental Threats of Cryptocurrencies for Vulnerable and Low-Income Communities', *Energy Research & Social Science*, 84.102394 (2022), 1–9 https://doi.org/10.1016/j.erss.2021.102394
[23]Antonio Díaz, Carlos Esparcia, and Diego Huélamo, 'Stablecoins as a Tool to Mitigate the Downside Risk of Cryptocurrency Portfolios', *North American Journal of Economics and Finance*, 64.101838 (2023), 1–26 https://doi.org/10.1016/j.najef.2022.101838
[24]Nandan Gowda and Chandrani Chakravorty, 'Comparative Study on Cryptocurrency Transaction and Banking Transaction', *Global Transitions Proceedings*, 2.2 (2021), 530–34 https://doi.org/10.1016/j.gltp.2021.08.064

	result in huge savings by avoiding bank/institution transfer fees.	transaction process, it is nearly impossible to retrieve lost coins or tokens.
3	Transactions are almost instantaneous and can be made at any time.	Cryptocurrency is vulnerable to fraud, and the lack of regulations could result in a lack of consumer trust.
4	Blockchain, the technology behind cryptocurrency, immediately overcomes the problem of double spending and duplication of digital currencies, thereby making them secure.	Cryptocurrency represents a primary concern for authorities because of its vulnerability to money laundering and illicit use.

Source: *Atif Aziz, 'Cryptocurrency: Evolution & Legal Dimension', International Journal of Business, Economics and Law, 18.4 (2019), 31–33.*

The advantages and disadvantages of cryptocurrency listed above, there are no uniform legal arrangements among countries, even though the regulations vary widely. The purpose of using cryptocurrency can simultaneously attract the attention of several domestic regulators with fundamentally different frameworks and objectives. Some regulators may prioritize consumer protection, safety and health, or financial integrity. Implementing existing regulatory frameworks for a cryptocurrency (or developing new ones) is challenging for several reasons. For one, the cryptocurrency world is thriving. Regulators scramble to acquire talent and learn the skills needed to compensate for limited resources and other priorities. National regulators have struggled to keep up with the rapid growth of the cryptocurrency ecosystem and technological advancements to maintain a united and consistent approach.[25] In short, overall, national authorities take very different approaches to regulatory policies for cryptocurrency.

Increased efforts to control cryptocurrency have resulted from its phenomenal, if erratic, growth in market capitalization and its entrance into the regulated financial system. The variety of cryptocurrency products and services is also increasing, as are innovations that have facilitated issuance and transactions. The failures of cryptocurrency issuers, exchanges and hedge funds, as well as the recent decline in cryptocurrency valuations, such as the recent collapse of the FTX, which secretly used customer funds to bail out its sister company, Alameda Research, have added impetus to regulate.[26] In this case, each country uses a different approach to address cryptocurrency use. According to Florea and Pustelnik, these approaches are divided into three categories: progressive (Japan, Switzerland, Germany, Malta, and Estonia), intermediate/balanced (the Netherlands, Portugal, Slovakia, Slovenia, Romania, Hungary, Spain, and Cyprus), and restrictive (China).[27]

[25] Agata Ferreira and Philipp Sandner, 'EU Search for Regulatory Answers to Crypto Assets and Their Place in the Financial Markets' Infrastructure', *Computer Law and Security Review*, 43.105632 (2021), 1–15 https://doi.org/10.1016/j.clsr.2021.105632

[26] Seung Ah Lee and George Milunovich, 'Digital Exchanges Attributes and the Risk of Closure', *Blockchain: Research and Applications*, 100131, 2023 https://doi.org/10.1016/j.bcra.2023.100131

[27] Elena S. Florea and Evgheni Pustelnik, 'On Regulation of Cryptocurrency: International Experience', *International Scientific Journal, Supremacy of Law*, 1.1 (2021), 69–83 https://doi.org/10.52388/2345-1971.2021.1.06

More comprehensively, the Global Future Council on Cryptocurrencies outlines four general approaches for the regulators of each country to design a legal framework for cryptocurrency, as illustrated in Table 2.

Table 2. Approaches to Cryptocurrency Arrangement

No.	Description	Countries
1	**“Wait and see” approach**: The “wait and see” regulatory approach denotes refraining from imposing particular regulations on the emerging industry to promote its growth. This approach often combines already-existing laws and regulations with careful observation, resulting in the timely creation of a regulatory framework that mitigates the associated risks.	Brazil
2	**Public-private partnership approach (balanced approach):** Public-private partnerships or proportionate/balanced risk approaches require collaborative engagement between policymakers, regulators, and the private sector through task forces and/or innovation centers on the design and implementation of laws and regulations intended to develop innovative and inclusive financial systems.	Singapore, the European Union
3	**Comprehensive regulatory approach:** The comprehensive regulatory approach entails creating and implementing regulations governing the regulated entity’s operations. This regulation may include licensing requirements, such as reporting requirements and anti-money laundering and counter-terrorism financing, for companies that offer financial services and foreign exchange limitations for international transactions.	Switzerland, Japan, New York, USA.
4	**Restrictive approach:** The restrictive approach implies applying a broad range of restrictive measures that generally affect the market. This approach may be based on a conservative or prudent view and may stem from specific market experiences or events.	Turkey, India, Nigeria, and China

Source*: Global Future Council on Cryptocurrencies, Navigating Cryptocurrency Regulation: An Industry Perspective on the Insights and Tools Needed to Shape Balanced Crypto Regulation (Geneva: World Economic Forum, 2021).*

Based on the four categories of general approaches above, according to the author, Indonesia is included in the category of countries that apply the public-private partnership approach (balanced approach). This can be seen from the collaborative involvement of policymakers (Ministry of Trade), regulators (CoFTRA), and the private sector in the design and implementation of certain regulations to develop an inclusive and innovative financial system for cryptocurrency. In this context, the Government of Indonesia legalizes the use of cryptocurrency as a commodity but not as a medium of exchange or means of payment, providing room for development and innovation while also being responsive in adapting to the dynamics of using cryptocurrency. This statement is supported by the efforts to protect the use of cryptocurrency through the creation of several (although still limited) ministerial regulations and the imposition of taxes on cryptocurrency.

This logical step of the government toward taxing cryptocurrency can be said to follow the global trend in regulating tax collection on blockchain and cryptocurrency.[28] Basically, digital technology can provide a means for sophisticated individuals and firms to hide sensitive information or evade taxes through cryptocurrency.[29] In this context, the taxation of cryptocurrency can limit the use of cryptocurrency for illegal purposes and increase the potential for state revenue. Previously, the government imposed income tax (PPh) and value added tax (VAT) on crypto assets on May 1. Since then, crypto asset transactions have been subject to final PPh and VAT rates. The provisions regarding this cryptocurrency tax are contained in the Minister of Finance Regulation (PMK) Number 68/PMK.03/2022 concerning Value Added Tax and Income Tax on Crypto Asset Trading Transactions. This taxation, in essence, can be interpreted as a form of legalization or government recognition of the use of cryptocurrency. More importantly, it provides conditions that enable blockchain's reception and adoption in Indonesia.

Based on the four general approach categories above, the Global Future Council on Cryptocurrencies mapped the legal status of the use of cryptocurrency in several countries around the world as of September 2021 (Table 3).

Table 3. Legal Status of Cryptocurrency Around the World

No.	Description	Countries
1	**Permissive laws and regulations**: Countries with permissive laws and regulations will include the first three approaches described in the topic above: namely the "wait and see" approach, the public-private partnership approach, and the comprehensive regulatory approach.	The United States, Canada, Mexico, Brazil, Argentina, the United Kingdom, European Union, Russia, the United Arab Emirates, Japan, South Korea, the Philippines, Malaysia, Singapore, Australia, New Zealand, and South Africa, among others.
2	**Prohibitive laws and regulations**: Countries that prefer laws and regulations that are more restrictive, as described in the latter approach mentioned above: namely the restrictive approach.	Morocco, Nigeria, Egypt, Iraq, Bangladesh, Nepal, and China (in late September 2021, the People's Bank of China banned all cryptocurrency transactions), among others.
3	**Partial and/or imminent bans or mostly controversial status**: Countries that have adopted partial and/or immediate bans or countries where the situation is controversial.	Tunisia, Turkey, Saudi Arabia, India, Vietnam, Thailand, and Indonesia, among others.

Source: *Global Future Council on Cryptocurrencies, Navigating Cryptocurrency Regulation: An Industry Perspective on the Insights and Tools Needed to Shape Balanced Crypto Regulation (Geneva: World Economic Forum, 2021).*

Based on the table above, the Global Future Council on Cryptocurrencies labels the legal status of cryptocurrency in Indonesia as partial or mostly controversial. Such a status means that the legal regulation of cryptocurrency in Indonesia is still partial compared to

[28]Pablo Sánchez-Núñez and Yolanda García Calvente, 'Tax Regulation on Blockchain and Cryptocurrency: The Implications for Open Innovation', *Journal of Open Innovation: Technology, Market, and Complexity*, 7.98 (2021), 1–21 https://doi.org/ 10.3390/joitmc7010098
[29]Edidiong Bassey, Emer Mulligan, and Ojo Adegboyega, 'A Conceptual Framework for Digital Tax Administration - A Systematic Review', *Government Information Quarterly*, 39.101754 (2022), 1–15 https://doi.org/10.1016/j.giq.2022.101754

countries with permissive or progressive statuses, such as Japan and Singapore. This partiality is reflected in the regulation of cryptocurrencies that have not been permanently institutionalized in the legal system through a statute (*undang-undang*). Cryptocurrency regulation in Indonesia, in practice, relies solely on regulations at the ministry level for two leading regulatory agencies, namely CoFTRA under the Ministry of Trade and Bank Indonesia (the central bank). This practice means regulating cryptocurrency is a government policy that can change and is not a fixed state policy. By comparison, Japan has already implemented The Payment Services Act (Act 59/2009) and its Amendment (Act 50/2020), and Singapore has implemented the Payment Services Act (2019). These acts substantially regulate crypto asset exchanges and custody services and provide these countries with advanced legal and regulatory regimes. As mentioned earlier, the absence of a legal basis in the form of a statute also indicates that the use of cryptocurrency in Indonesia conceptually focuses more on the "Business First, Regulation Later" approach.

As a country that has adopted a partial status, Indonesia could take cryptocurrency regulation to a new level of advanced legal and regulatory regimes. Indeed, cryptocurrency presents new and relatively complex governance challenges, considering their speculative nature and potential impact on the overall stability of the monetary and financial system, given that they operate without government or central bank oversight, and their *raison d'̏etre*, is a threat to central banks.[30] Furthermore, cryptocurrency is a new asset class often plagued by accusations of unethical, fraudulent, and illegal activity.[31] Influential individuals, through their social media activity, also significantly impact cryptocurrency markets.[32] Cryptocurrency, by necessity, is subject to government regulatory arrangements. Such regulatory arrangements, which vary from total risk-aversion to governmental endorsement, present different obstacles and consequences for consumers, industry, and innovation, as well as the government. In the long term, Indonesia needs regulatory certainty in the form of a statute, such as a digital asset law. The resultant clarity in the regulatory status of cryptocurrency will allow the ecosystem to grow and promote innovation, thus harnessing the benefits of cryptocurrency while mitigating related risks.

2.2. Regulation of Cryptocurrency Usage in Indonesia

The national cryptocurrency regulation is a difficult task for several reasons. First, there are no reliable international data on cryptocurrency use. Second, these assets and associated financial activities are opaque. Third, there is a general lack of understanding of cryptocurrency within national regulatory frameworks.[33] This situation is reasonable regarding the context of cryptocurrency regulation in Indonesia, particularly considering the general lack of understanding of cryptocurrency within national regulatory frameworks. The primary problem in Indonesia is the absence of a clear national policy

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[30]Lanouar Charfeddine, Noureddine Benlagha, and Youcef Maouchi, 'Investigating The Dynamic Relationship between Cryptocurrencies and Conventional Assets: Implications for Financial Investors', *Economic Modelling*, 85 (2020), 198–217 https://doi.org/10.1016/j.econmod.2019.05.016

[31]Akanksha Jalan and others, 'The Role of Interpersonal Trust in Cryptocurrency Adoption', *Journal of International Financial Markets, Institutions & Money*, 2022, 1–58 https://doi.org/10.1016/j.intfin.2022.101715

[32]Lennart Ante, 'How Elon Musk's Twitter Activity Moves Cryptocurrency Markets', *Technological Forecasting & Social Change*, 186.122112 (2023) https://doi.org/10.1016/j.techfore.2022.122112

[33]Nicolás Gonzálvez-Gallego and Concepción María Pérez-Cárceles, 'Cryptocurrencies and Illicit Practices: The Role of Governance', *Economic Analysis and Policy*, 72 (2021), 203–12 https://doi.org/10.1016/j.eap.2021.08.003

framework to govern the cryptocurrency market and legally safeguard the parties involved.[34]

Cryptocurrency regulation in Indonesia has undergone several developments. Bank Indonesia (the central bank) initiated the initial arrangement as an institution with authority related to the country's financial regulations. In 2014, Bank Indonesia released Press Release Number 16/6/Dkom 2014 regarding Bitcoin and Virtual Currency. In this press release, Bank Indonesia expressly states that virtual currencies, including bitcoin, are not legal tender in Indonesia. In this provision, Bank Indonesia refers to Law Number 7 of 2011 concerning Currency. Article 1, point 1, of this law explains that currency is money issued by the Government of Indonesia, henceforth referred to as the rupiah. In addition, Bank Indonesia mentions the obligation to use the rupiah in every transaction within the territory of Indonesia. This regulation is further regulated in Bank Indonesia Regulation Number 17/3/PBI/2015 concerning the Obligation to Use Rupiah in the Territory of the Republic of Indonesia. According to this regulation, each party must use rupiah in transactions conducted within the territory of Indonesia.[35]

In addition to prohibiting the use of crypto assets as a means of payment, Bank Indonesia further warns all parties not to sell, buy, or trade virtual currencies based on the assessment that virtual currencies, including cryptocurrencies, pose a significant risk to the financial system's stability. This assessment is based on the absence of a party officially responsible for the sustainability of the virtual currency system. The absence of such an official authority makes virtual currencies highly speculative. The trade value also becomes very volatile, making cryptocurrencies vulnerable to bubbles.[36] The prohibition is also based on the characteristics of cryptocurrency that enable it to be easily misused for criminal activities, such as money laundering, terrorism, and narcotics trafficking. In addition, the value of cryptocurrency is very volatile, and the cryptocurrency system's character is decentralized, meaning there is no central bank or financial institution to back it up.[37]

Even though Bank Indonesia has issued regulations regarding cryptocurrency, in 2018, the Minister of Trade Regulation (Permendag) Number 99 of 2018 concerning the General Policy for Implementing Crypto Asset Futures Trading appeared. This regulation can be regarded as an important step that legitimizes the use of cryptocurrency in Indonesia. After Bank Indonesia banned cryptocurrency as a means of payment in Indonesia, the Minister of Trade identified cryptocurrency as a form of tradable futures assets. Article 1 of the Permendag stipulates that crypto assets are designated as commodities that can be subject to futures contracts traded on futures exchanges. In the next article, it is stated that the guidance, supervision, and development of cryptocurrency assets on the futures exchange

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[34]Chang, Soonpeel Edgar, 'Legal Status of Cryptocurrency in Indonesia and Legal Analysis of the Business Activities in Terms of Cryptocurrency', Brawijaya Law Journal, 6.1 (2019), 76–93 http://dx.doi.org/10.21776/ub.blj.2019.006.01.06

[35]Paresh Kumar Narayan and others, 'Bitcoin Price Growth and Indonesia's Monetary System', *Emerging Markets Review*, 38.November 2018 (2019), 364–76 https://doi.org/10.1016/j.ememar.2018.11.005

[36]Elissar Toufaily, 'An Integrative Model of Trust toward Crypto-Tokens Applications: A Customer Perspective Approach', *Digital Business*, 2.2 (2022), 100041 https://doi.org/10.1016/j.digbus.2022.100041

[37]V. Anitha and others, 'Transparent Voting System Using Blockchain', *Measurement: Sensors*, 25.December 2022 (2023), 100620 https://doi.org/10.1016/j.measen.2022.100620

are to be regulated by CoFTRA.[38] The duality of regulation by the two ministries is reasonable, as each institution uses a different juridical basis. Bank Indonesia's prohibition of the use of cryptocurrency as a means of payment rests on Law Number 7 of 2011 concerning currencies, while the Ministry of Trade's recognition of cryptocurrency as a commodity relies on Law Number 32 of 1997 concerning Commodity Futures Trading, as amended by Law Number 10 of 2011 concerning amendments to Law 32 of 1997 concerning Commodity Futures Trading (the PBK Law).

Although the object discussed is only one function of cryptocurrency, legal treatments will differ if cryptocurrency is used as a mode of payment or functions as a commodity. The difference between Bank Indonesia's policy, which prohibits the use of cryptocurrency as a means of payment, and CoFTRA, which allows cryptocurrency to be traded on the futures exchange, does not need to be interpreted as an inconsistency. In this case, the regulator in the financial services sector, considering that each authority has a unique jurisdiction. This difference is a logical consequence, considering that the division of the role of regulators in the financial services sector in Indonesia is not based on the product but on its function. Thus, one financial product may have to comply with the requirements set by more than one authority.[39]

If the public and legal certainty of business actors are to be protected, it is necessary to regulate crypto asset trading. Based on a review of the PBK Law, the government concluded that digital commodities or cryptocurrency commodities from the blockchain system could be categorized as rights or interests; thus, they are categorized as commodities. Crypto assets are also considered to have developed widely in the community and are worthy subjects of futures contracts on the futures exchange. Crypto assets are still not authorized as a means of exchange. However, they are permitted as a type of investment instrument and are commodities exchanged in futures markets. Due to crypto assets' strong economic potential, they must be considered. If they are restricted, consumers will search for markets that accept cryptocurrency transactions, which will reduce the number of investments made (capital outflow).[40]

The government legalized cryptocurrency trading as a commodity for four main reasons: (i) to give crypto asset trading and business actors in Indonesia legal certainty; (ii) to protect crypto asset customers from potential losses from trading crypto assets; (iii) to promote the innovation, growth, and development of crypto asset physical trading business activities in Indonesia; and (iv) to prevent the use of crypto assets for illicit activities like money laundering and financing terrorism. Meanwhile, there are several factors underlying the determination of crypto assets as commodities by the government: (i) the price of crypto assets (coins or tokens) is very volatile, and the process of trading them is very liquid; (ii) crypto assets emerging from blockchain technology are traded freely without government intervention; (iii) crypto assets have a very large market capacity (demand and supply), both at the national and global level; and (iv) as a digital commodity,

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[38]John E. Marthinsen and Steven R. Gordon, 'Hyperinflation, Optimal Currency Scopes, and a Cryptocurrency Alternative to Dollarization', *Quarterly Review of Economics and Finance*, 85 (2022), 161–73 https://doi.org/10.1016/j.qref.2020.12.007
[39]Bhimani, Hausken, and Arif.
[40]Abdurrashid Ibrahim Sanka and others, 'A Survey of Breakthrough in Blockchain Technology: Adoptions, Applications, Challenges and Future Research', *Computer Communications*, 169.March 2020 (2021), 179–201 https://doi.org/10.1016/j.comcom.2020.12.028

cryptocurrency assets adhere to the same guidelines as conventional commodities, including using technology, having a price or value, being tradable, and being recognized as a payment method in some businesses and communities.[41]

Commodities in Article 1 point 2 of the PBK Law are determined as "all goods, services, other rights and interests, and any derivatives of commodities that can be traded and are subject to futures contracts, sharia derivative contracts, and/or other derivative contracts." Furthermore, Article 3 of the PBK Law states that "Commodities that can be subject to Futures Contracts, Sharia Derivative Contracts, and/or other Derivative Contracts are regulated by the Regulation of the Head of CoFTRA." Therefore, CoFTRA has the authority to regulate commodities, including, in this case, cryptocurrency as commodities.

Based on the Regulation of the Minister of Trade Number 99 of 2018, the Regulation of the Minister of Trade Number 5 of 2019 was made regarding the Technical Provisions for the Implementation of the Physical Market for Crypto Assets on the Futures Exchange. In Article 1, paragraph (7), of this regulation, the definition of a crypto asset is further clarified. Specifically, a crypto asset is defined as an intangible commodity in the form of a digital asset, using cryptography, peer-to-peer networks, and a distributed ledger (blockchain) to regulate the creation of units, perform new transactions, verify transactions, and secure transactions without interference from other parties.[42] Furthermore, in CoFTRA Regulation No. 11 of 2022 concerning the Establishment of a List of Crypto Assets Traded in the Physical Crypto Asset Market, only 383 cryptocurrency assets can be traded on the physical crypto asset market by exchanges that have obtained a license in Indonesia.

2.3. Protection of Cryptocurrency Usage in Indonesia

Cryptocurrency has developed widely in the community and should be the subject of futures contracts on the futures exchange. Cryptocurrency transactions have experienced an extraordinary surge in Indonesia, and the increase in the number of investors has also been significant. Investors of cryptocurrency tend to be educated, young, and digital natives.[43] In protecting the community and providing legal certainty for business actors, it is necessary to regulate cryptocurrency trading. This necessity forms an understanding that cryptocurrency, as an asset and commodity, has the potential to be a digital product and create a new ecosystem. Governments could enact laws that restrict or permit mining or tax capital gains from cryptocurrencies, defend people against potential fraud and prevent the national currency from being used as a second currency, ensure that the central bank participates in the ecosystem of cryptocurrency regulation by controlling whether banks are allowed to use cryptocurrencies for banking purposes, and give the security exchange commission the power to control exchanges and investor restrictions.[44] In the Indonesian

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[41]Laith Almaqableh and others, 'An Investigative Study of Links between Terrorist Attacks and Cryptocurrency Markets', *Journal of Business Research*, 147.May 2020 (2022), 177–88 https://doi.org/10.1016/j.jbusres.2022.04.019

[42]Harryarsana, p. 78-79.

[43]Raphael Auer and David Tercero-Lucas, 'Distrust or Speculation? The Socioeconomic Drivers of U.S. Cryptocurrency Investments', *Journal of Financial Stability*, 62.101066 (2022), 1–23 https://doi.org/10.1016/j.jfs.2022.101066

[44]Bonaparte Yosef and Gennaro Bernile, 'A New "Wall Street Darling?" Effects of Regulation Sentiment in Cryptocurrency Markets', *Finance Research Letters*, 103376, (2022), 1–10 https://doi.org/10.1016/j.frl.2022.103376

context, the key players that may be involved in the protection of cryptocurrency use are Bank Indonesia, the Ministry of Communication and Information Technology, and CoFTRA.

The Indonesian government has created several regulations to support the interests of people who use cryptocurrency, namely through the policy of the Minister of Trade of the Republic of Indonesia Number 99 of 2019 concerning General Policy for the Implementation of Crypto Asset Futures Trading. This regulation further attributes the authority to regulate cryptocurrency to CoFTRA. CoFTRA subsequently established CoFTRA Regulation Number 5 of 2019 concerning Technical Provisions for the Implementation of the Crypto Asset Physical Market on the Futures Exchange. This technical regulation was formed to ensure legal certainty and protection for cryptocurrency investors. The form of legal protection given to cryptocurrency investors based on this regulation is that all cryptocurrency marketplaces must meet all the requirements set out in the CoFTRA rules.[45]

CoFTRA regulates not only the marketplace aiming to become a cryptocurrency platform in Indonesia but also investors who want to buy and sell cryptocurrency when the conditions that must be met are that investors first possess the money that will be used for transaction activities in a separate account in the name of the marketplace intended for the benefit of the Futures Clearing House. Cryptocurrency investors can only sell crypto assets if they have a crypto marketplace balance. If the crypto marketplace commits a violation, then the sanction of cancellation of approval can be given. Should such approval be terminated, the cryptocurrency exchange is obligated to return any funds owned by the consumers it administers and is not permitted to take on any new consumers.[46]

Currently, in Indonesia, 25 prospective physical crypto asset traders (exchanges) are applying for registration at CoFTRA and already have registration certificates, including PT Aset Digital Berkat (www.tokocrypto.com), PT Indodax Nasional Indonesia (www. indodax.com), and PT Pintu Kemana (https://door.co.id/). The registration of these exchanges is part of the scheme to establish a crypto asset futures exchange by CoFTRA. Any crypto asset that does not comply with CoFTRA regulations cannot be traded in Indonesia. This condition implies that any exchanges and crypto asset products traded must be registered with CoFTRA.[47]

Furthermore, in the context of monitoring crypto asset trading and continuing to educate and improve public literacy, CoFTRA, through the Press Release of the Public Relations Bureau, dated 27 July 2022, suggested the following conditions: (i) the public must become customers of companies that have a registration certificate from CoFTRA; (ii) the funds used must be legally generated surplus funds and not funds used for daily needs; (iii) funds must be invested in the type of product (coins or tokens) that CoFTRA has determined, the risks that may arise must be studied, and the commodity prices that occur

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[45]Dewa Ayu Fera Nitha and I Ketut Westra, 'Investasi Cryptocurrency Berdasarkan Peraturan Bappebti No. 5 Tahun 2019', *Jurnal Magister Hukum Udayana (Udayana Master Law Journal)*, 9.4 (2020), 712–22 https://doi.org/10.24843/JMHU.2020.v09.i04.p04
[46]Nitha & Westra, p. 718.
[47]Nicola Borri and Kirill Shakhnov, 'Regulation Spillovers across Cryptocurrency Markets', *Finance Research Letters*, 36.July 2019 (2020), 101333 https://doi.org/10.1016/j.frl.2019.101333

due to fluctuating prices must be developed; and (iv) promises of high or fixed profits must never be believed. The Financial Services Authority, through the Investment Alert Task Force, also urges investors to use legal platforms for crypto transactions. The legal platform for a cryptocurrency exchange is a platform registered with CoFTRA that protects users when problems occur.

Investors can guarantee the safety and legal certainty of contracts. In addition to the CoFTRA regulations referred to above, Law Number 11 of 2008 concerning Electronic Information and Transactions provides legal protection through the regulation in Article 9, which stipulates that "Every business actor who offers products through an electronic system must provide complete and correct information relating to the terms of the contract, the manufacturer, and the product offered." With the provisions in the regulation, cryptocurrency investors can guarantee that their investments are safe because the crypto asset marketplace, as a crypto asset trader, would have first guaranteed their funds; thus, crypto asset traders cannot easily deceive cryptocurrency investors.[48]

The above regulation regarding cryptocurrency investment by CoFTRA does not guarantee that there will eventually be no disputes between cryptocurrency investors and the cryptocurrency marketplace. Dispute resolution is regulated in CoFTRA regulations, where settlements are still prioritized through deliberation and consensus, namely the family way. If a consensus is not reached, the parties in the physical transaction who are trading the crypto assets in dispute can settle through the arbitration provided by the futures exchange through the Commodity Futures Trading Arbitration Board (BAKTI). Litigation legal remedies will be carried out if the problem is not resolved through mediation and BAKTI is not reached. In this case, the parties can also choose to dispute the resolution through the Consumer Dispute Settlement Agency. Concerning legal protection against the losses experienced by investors as consumers in crypto asset transactions that contain elements of fraud by business actors who sell crypto assets, investors can file a dispute settlement lawsuit to the Consumer Dispute Settlement Agency, whose decision is final and binding. If an element of crime in a cryptocurrency investment arises later, business actors or consumers and cryptocurrency investors can report the crime to the authorities by enacting Law Number 11 of 2018 concerning Information and Electronic Transactions, as amended by Law Number 19 of 2016 concerning Amendments to Law Number 11 of 2018 concerning Information and Electronic Transactions.[49]

The above descriptions indicate that regarding the use of cryptocurrencies as commodities or crypto assets traded on futures exchanges registered or licensed by CoFTRA, the government's presence in the context of providing protection to consumers or cryptocurrency investors is sufficient. The next issue to discuss is how to protect domestic investors who invest in foreign futures exchanges and not yet registered and licensed by CoFTRA, such as Binance and Coinbase Exchange. These two exchanges are the largest in the world in terms of market cap and have advanced features such as a non-

[48]Sitara Karim and others, 'The Dark Side of Bitcoin: Do Emerging Asian Islamic Markets Help Subdue the Ethical Risk?', *Emerging Markets Review*, 54.January 2022 (2023), 100921 https://doi.org/10.1016/j.ememar.2022.100921
[49] Nitha & Westra, p. 718.

fungible token marketplace, futures, savings, farming, and staking, which are profitable and relatively risk-controlled. These features are clearly not owned by local exchanges.[50]

The short answer to this issue is that the government provides no protection. This statement is logical considering the regulatory framework for the government's protection through several regulations related to the use of cryptocurrency, especially those aimed at domestic investors who invest in licensed exchanges for crypto assets that are permitted to be traded in Indonesia. Simply put, all risks related to the ownership and use of cryptocurrency must be borne entirely by the user (do at your own risk). This lack of government protection applies to the use of cryptocurrency as a means of payment between parties made in a peer-to-peer manner. This statement is also logical considering that using cryptocurrency to replace the rupiah is prohibited. In this context of protection, according to the author, it would be better if the government banned cryptocurrency trading through exchanges that were not registered with CoFTRA. Furthermore, in the long term, the government needs to design a digital asset law that focuses on the oversights of virtual asset service providers and that requires crypto businesses to store customer funds separately from company funds to prevent the risk of misuse.[51]

2.4. Regulation and Protection of Cryptocurrency Usage in European Union

The absence of a clear and defined EU regulatory framework on cryptoasset market regulation is at the basis of the recent proposal for a Regulation of the European Parliament and of the Council on crypto-asset markets, which amends Directive (EU) 2019/ 1937, the so-called Markets in Crypto-Assets (MiCA) European Regulation. Lack of legal certainty and absence of a specific and coherent regulatory and supervisory regime at EU level have indeed, to date, forced operators active in the crypto-asset sector to familiarize themselves with the laws of different Member States, to obtain different national authorizations and to comply with different laws. As widely announced for almost two years now, Europe has taken its steps in the field of regulation of blockchain-based assets at the level of the entire EU. After a series of debates and analyzes that led to various adjustments to the original regulatory draft (among them the abandonment of the limitations on the use of Proof-of-Work algorithms, a system used for example by Bitcoin and Ethereum), the proposal European Regulation has therefore arrived in its final version. The announcement of its approval, to be scrutinized by the Commission and Parliament, has aroused various applause, above all from traditional finance operators, but also from the general media, mainly because the European legislator intended to direct its choices, at least at the level of intent, in a protectionist sense in favor of a figure so dear to it, that of the consumer. According to the Council, the emerging regulatory framework will protect investors and preserve financial stability, while enabling innovation and boosting the attractiveness of the cryptocurrency sector.[52]

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[50]Khaled Gubran Al-Hashedi and Pritheega Magalingam, 'Financial Fraud Detection Applying Data Mining Techniques: A Comprehensive Review from 2009 to 2019', *Computer Science Review*, 40 (2021) https://doi.org/10.1016/j.cosrev.2021.100402

[51]Robert Muliawan Jaya and others, 'Blockchain Applications in Drug Data Records', *Procedia Computer Science*, 216 (2023), 739–48 https://doi.org/10.1016/j.procs.2022.12.191

[52]Yoon Chow Yeong and others, 'Sustainable Cryptocurrency Adoption Assessment among IT Enthusiasts and Cryptocurrency Social Communities', *Sustainable Energy Technologies and Assessments*, 52.PA (2022), 102085 https://doi.org/10.1016/j.seta.2022.102085

Hence the numerous rules imposed, above all on economic operators who intend to offer services in this field, who we can define as the true recipients of the legislation. With a choice that has met with numerous perplexities, the European legislator has decided to exclude from the proposed regulation to be submitted to the newly approved legislative formation procedure the other major operational area of applications based on blockchains, consisting of NFTs. Given the still partially embryonic nature of the practical implications linked to the world of Non Fungible Tokens, in fact, the Board has planned to carry out a more careful analysis of the phenomenon and a further and more in-depth assessment of the risk profiles linked to this type of asset, postponing his decision to intervene eighteen months. This type of approach therefore appears to be substantially based on the awareness of the typicality of the phenomenon, which regardless of its basis, constituted by the blockchains, is in some ways independent from the financial instruments connected to them. On the other hand, in the process of regulatory formation within Europe it is the usual practice (as well as the rule) to proceed, before the proposal for a regulation, through more or less complex procedures of observation and consultation, which then lead to the identification of the lines of intervention which then flow into the proposal for a regulation proper.[53]

Alongside the MiCa, the Union has just taken steps to definitively introduce specific legislation aimed at economic operators operating through distributed ledger technologies (DLT). This is Regulation no. 858/2022, whose direct applicability is expected from 23 March 2023, which has set itself the goal of imposing the adoption of a pilot regime for market infrastructures based on distributed ledger technology, with particular reference, as stated in the 'Art.1, to granting and withdrawing specific authorizations to operate DLT market infrastructures in accordance with this regulation; the granting, modification and revocation of exemptions to specific authorisations; the imposition, modification and revocation of conditions related to exemptions and in relation to the imposition, modification and revocation of compensatory or remedial measures; the management of DLT market infrastructures; supervision of DLT market infrastructures; collaboration between DLT market infrastructure managers, the competent authorities and the European Supervisory Authority (European Securities and Markets Authority) established by Regulation (EU) no. 1095/2010 (ESMA).[54]

In essence, a regulatory framework has been envisaged for the operators of these platforms who admit financial instruments based on DLT technology to trading, in tokenized form, in order to contribute to the development of a secondary market for these assets, in order to complete the circular regulatory project also composed by igital Operational Resilience Act (DORA), in the field of cyber security, and by MiCa itself, with regard to crypto-assets. In fact, it is worth emphasizing that the regulation relating to DLT-based infrastructures does not directly concern crypto-assets, the inclusion of which in these provisions is subject only to cases in which they are also "financial instruments" (in the sense of EU Directive 2014/ 65) while, if they are not, they will not be admitted to

[53]Peter Howson and Alex de Vries, 'Preying on the Poor? Opportunities and Challenges for Tackling the Social and Environmental Threats of Cryptocurrencies for Vulnerable and Low-Income Communities', *Energy Research and Social Science*, 84.August 2021 (2022), 102394 https://doi.org/10.1016/j.erss.2021.102394
[54]Dodik Siswantoro, Rangga Handika, and Aria Farah Mita, 'The Requirements of Cryptocurrency for Money, an Islamic View', *Heliyon*, 6.1 (2020), e03235 https://doi.org/10.1016/j.heliyon.2020.e03235

the DLT markets but will fall within the scope of application of the MiCa. The proposed MiCA Regulation aims to pursue four objectives: a. legal certainty within a defined and consolidated legal framework; b. support for innovation and fair competition, with a view to promoting the development of crypto-assets and broader use of DLT; c. ensuring adequate levels of consumer and investor protection and market integrity; d. guarantee of financial stability, particularly concerning some crypto-assets, such as stablecoins, which could create many problems in the future in the economic-financial system, should their widespread acceptance occur.

It should be remembered that the MiCA Regulation is part of a broader package of reforms adopted by the European Commission, the so-called Digital Finance Packages. This package of reforms aims to make the financial sector of the European Union more competitive, promoting responsible innovation with rules that are safer for consumers and, at the same time, more favorable to digital development. The provisions of the MiCA Regulation will apply only to crypto-assets that do not qualify as financial instruments and which, therefore, cannot be assimilated to financial instruments, deposits or structured deposits, securitizations and electronic money. These instruments will continue to be governed by existing EU legislation on financial services.[55]

From a subjective point of view, the MiCA Regulation applies to subjects involved in the issuance of crypto-assets or who provide related services within the European Union, with some exceptions provided for in absolute terms for the European Central Bank and the banks national central banks of the Member States, when acting as monetary authority, as well as for other public international organisations. There is also a system of partial exemptions for credit institutions and investment companies, insurance and reinsurance companies, as well as subjects who perform crypto-asset services for associated companies. However, it should be emphasized that in these cases these are specific exceptions: for example, for credit institutions, in the case of the issuance of tokens linked to assets (so-called Asset referenced tokens - ART), the MiCA Regulation will not apply in some of its provisions. A similar principle of partial exemption is envisaged for investment firms authorized pursuant to Directive 2014/65/EU, which will not be subject to some of the provisions of the MiCA Regulation, but to which the rules on prudential and organizational requirements will still apply. The MiCA Regulation also establishes uniform transparency and disclosure obligations in relation to the issuance, operation, organization and governance of service providers for crypto-assets. It therefore provides for rules and measures regarding the supervision of service providers and consumer protection to prevent market abuse.[56]

2.5. The Importance of Using Digital Rupiah Cryptocurrency as a Payment Instrument

As described earlier, the use of cryptocurrency is divided into two types: as a means of payment and as commodities. In Indonesia, cryptocurrency are starting to become an investment tool in great demand by investors, as can be seen from the lower number of stock investors than the high number of crypto asset investors. The value of crypto assets

[55]Daniar Supriyadi, 'The Regulation of Personal and Non-Personal Data in the Context of Big Data', *Journal of Human Rights, Culture and Legal System*, 3.1 (2023), 33–69 https://doi.org/10.53955/jhcls.v3i1.71
[56]Devi Triasari, Willy Naresta Hanum, and Viddy Firmandiaz, 'Mapping Restorative Justice in Information and Electronic Transaction Criminal Regulation', *Journal of Human Rights, Culture and Legal System*, 3.1 (2023), 1–16 https://doi.org/https://doi.org/10.53955/jhcls.v3i1.75

skyrocketed very high because, for one reason, crypto asset investors saw an opportunity for digital money to be used as a means of payment. However, Indonesia still prohibits using cryptocurrency as a means of payment, even though several large global companies have provided services for using cryptocurrency for payment transactions. Cryptocurrency is not a legal tender because it is not in accordance with statutory provisions. Based on Article 23B of the 1945 Constitution of the Republic of Indonesia in conjunction with Article 1 points 1 and 2, Article 2 paragraph (1) and Article 21 paragraph (1) of the Law of the Republic of Indonesia Number 7 of 2011 concerning Currency, the legal currency that can be used as a means of payment in the territory of Indonesia is the Rupiah that has been issued legally and correctly by Bank Indonesia.[57]

Cryptocurrency are considered difficult to be classified as official currencies, especially in Indonesia, because national and economic policies do not influence the volatility of the price of this digital currency. The price value of each Cryptocurrency is dependent on user orders and quotes, so its value is not easy to maintain. For example, the value will increase if there are many orders for a certain currency while the bid is small. Cryptocurrency can be used as a medium of exchange, but its benefits are not widely accepted. Cryptocurrency is inversely proportional to fiat money which has been well accepted by the public and can be used by anyone, while cyptocurrency only exists in cyberspace, and only certain types of users can use it. At the global level, the legal status of cryptocurrency in each country varies. For example, China prohibits using cryptocurrency, accompanied by criminalizing its users. India prohibits banks from using cryptocurrency and makes their status as a currency illegal because crypto's value is unclear. The United States refuses to recognize it as a legal tender, except in certain states. In contrast, the State of El Salvador became the first country to recognize bitcoin and stable coin USD as legal tender on June 9, 2021.[58]

In addition to El Salvador, the Central African Republic has recognized bitcoin and the African Cfa Franc (XAF) since April 23, 2022, as legal tender. The Bahamas and Nigeria have also established their digital currency, in the form of the Bahamas central bank digital currency (SANDDollar) and the Nigeria central bank digital currency (eNaira).[59] Several developed countries in the world, such as the European Union (Euro), the United States (USD), and Russia (Rubel), are also considering the use of their country's central bank digital currency (CBDC) as a legal tender and more than 100 central banks around the world are actively considering their plans for CDBCs by the end of 2021.[60] In contrast to cryptocurrency, this new digital form of central bank money is created and regulated by a country or region's monetary authority and recognized as legal tender alongside central

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[57]S. Muslih, M., & Supeno, 'Financial Technology_ Digital Legal Challenges and Indonesia's Economic Prospects after Covid-19 Outbreak', *Legality: Jurnal Ilmiah Hukum*, 30.2 (2021), 255–266 https://doi.org/https://doi.org/10.22219/ljih.v30i2.22784
[58]R. W. Antikowati, A., Ulum, M. B., Soetijono, I. R., & Nugraha, 'Globalisation and Indonesia's Demand for Dual Citizenship_ Problems and Alternatives', *Legality : Jurnal Ilmiah Hukum*, 31.1 (2023), 42–58 https://doi.org/https://doi.org/10.22219/ljih.v31i1.24683
[59]Hela Mzoughi, Ramzi Benkraiem, and Khaled Guesmi, 'The Bitcoin Market Reaction to The Launch of Central Bank Digital Currencies', *Research in International Business and Finance*, 63.101800 (2022), 1–9 https://doi.org/10.1016/j.ribaf.2022.101800
[60]Vu Minh Ngo and others, 'Governance and Monetary Policy Impacts on Public Acceptance of CBDC Adoption', *Research in International Business and Finance*, 64.101865 (2023), 1–19 https://doi.org/10.1016/j.ribaf.2022.101865

bank reserves and cash.[61] This series of events, as mentioned above, shows a global trend of CBDC adoption as a legal tender backed by blockchain technology.

There is a strong belief that CBDCs have the potential to transform current monetary and financial arrangements and address long-standing issues within that sphere, not only locally but also globally. The use of CBDC is not only related to the issue of cryptocurrency but also relates to how the regulatory model and the existence of the meaning of the central bank of a country itself in relationship with the existence of the central bank in the international order. Every global development related to monetary policy will show the side of innovation and its vulnerability, which must be responded to. One of the challenges that then emerged was how central banks should rethink their strategy. The presence of crypto stablecoins that have emerged as digital versions of fiat currency has provided everyone with access to unlimited choices of paper money. CBDC itself is essentially a digital existence of cash in the wallet.[62]

Central banks are increasingly exploring the prospect of issuing digital versions of fiat money in response to recent developments in technology-driven payment systems. In this context, the government have realized that the use of cash itself has decreased. Digital cash will not replace cash itself but is developed as a strategy to strengthen a country's economy. This condition is an innovation that is more stable and versatile. Likewise, there is a need for regulation regarding Indonesian CBDC (Rupiah Digital). In the Indonesian context, this is possible given that Bank Indonesia, as the primary currency regulator, announced plans to issue a digital rupiah backed by blockchain in 2018.[63]

Based on Article 15 paragraph (1) letter c of Law Number 23 of 1999 concerning Bank Indonesia, Bank Indonesia may determine a new payment instrument in the form of CBDC. With the stipulation of CBDC by Bank Indonesia as a means of payment, the use of cryptocurrency as a legal means of payment can be limited to CBDC (Digital Rupiah) only so that its use no longer poses legal risks. The regulation of the Digital Rupiah cryptocurrency must first be determined so that when the CBDC is formed, the CBDC can be directly utilized by the community without causing any significant legal problems.[64] Therefore, it is necessary to regulate new types of cryptocurrency/virtual currencies within the limits of the authority of Bank Indonesia regarding establishing Digital Rupiah integration into blockchain technology. For example, Binance, as the largest exchange in the world today, in collaboration with local exchange Tokocrypto, has formed the digital currency Binance IDR (BIDR), which is integrated with blockchain technology to accommodate its consumers from Indonesia.

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[61]Sophia Kuehnlenz, Bianca Orsi, and Annina Kaltenbrunner, 'Central Bank Digital Currencies and the International Payment System: The Demise of the US Dollar?', *Research in International Business and Finance*, 64.101834 (2023), 1–12 https://doi.org/10.1016/j.ribaf.2022.101834

[62]Go Lisanawati and Erly Aristo, 'Urgensi Pengaturan Hukum Central Bank Digital Currency Dalam Dimensi Anti Pencucian Uang', *Veritas et Justitia*, 8.1 (2022), 49–75 https://doi.org/10.25123/vej.v8i1.4520

[63]Gerardo R. Ungson and Sada Soorapanth, 'The ASEAN Blockchain Roadmap', *Asia and the Global Economy*, 2.100047 (2022), 1–14 https://doi.org/10.1016/j.aglobe.2022.100047

[64]Ridoan Karim and Farahdilah Ghazali, 'Renewable Energy Regulations in Indonesia and India_ A Comparative Study on Legal Framework', *Journal of Indonesian Legal Studies*, 5.2 (2021), 361–90 https://doi.org/https://doi.org/10.15294/jils.v5i2.41986

3. Conclusion

Indonesia's experience in regulating the use of cryptocurrency has been dynamic and adaptive to the growth and development of cryptocurrency. However, Indonesia has not yet obtained the best form of regulation regarding cryptocurrency, as in the European Union. This is evidenced by Indonesia's regulatory approach to using cryptocurrency and its consequent inclusion in the category of countries that apply a balanced or intermediate approach. Meanwhile, in the context of cryptocurrency legality, Indonesia has a partial status, meaning that cryptocurrency legal regulations in Indonesia are less accommodating than regulations in countries with permissive or progressive status. This partiality is reflected in the cryptocurrency regulations that have not been permanently institutionalized in the legal system through the legislative process (*undang-undang*). Although the government's protection of cryptocurrency investors is adequate, the government should consider banning cryptocurrency trading through exchanges that are not registered with CoFTRA. Furthermore, in order to support the advancement of cryptocurrency, provide legal certainty for the cryptocurrency ecosystem, and respond to the widespread and inevitable use of cryptocurrency, the government needs to take a progressive policy in the form of the establishment of the Digital Asset Law. Such an arrangement will accelerate Indonesia's achievement as a digital community leader in Southeast Asia and as a country with a permissive or progressive status regarding the use of cryptocurrency.

References

'Mereka yang Tumbang di Kiamat Crypto 2022. Who's Next?', dir. by Angga Andinata, *Angga Andinata* (Youtube, 2022) https://www.youtube.com/watch?v=eoytkGX4sXU

Abuhashim, Alkhansaa A., and Chiu C. Tan, 'Improving Smart Contract Search by Semantic and Structural Clustering for Source Codes', *Blockchain: Research and Applications*, 2022, 1–20 https:// doi.org/10.1016/j.bcra.2022.100117

Al-Hashedi, Khaled Gubran, and Pritheega Magalingam, 'Financial Fraud Detection Applying Data Mining Techniques: A Comprehensive Review from 2009 to 2019', *Computer Science Review*, 40 (2021) https://doi.org/10.1016/j.cosrev.2021.100402

Almaqableh, Laith, Krishna Reddy, Vijay Pereira, Vikash Ramiah, Damien Wallace, and Jose Francisco Veron, 'An Investigative Study of Links between Terrorist Attacks and Cryptocurrency Markets', *Journal of Business Research*, 147.May 2020 (2022), 177–88 https://doi.org/10.1016/j.jbusres.2022.04.019

Anitha, V., Orlando Juan Marquez Caro, R. Sudharsan, S. Yoganandan, and M. Vimal, 'Transparent Voting System Using Blockchain', *Measurement: Sensors*, 25.December 2022 (2023), 100620 https://doi.org/10.1016/j.measen.2022.100620

Annur, Cindy Mutia, 'Jumlah Pengguna Internet Di Indonesia (2018-2022*)', *Ada 204,7 Juta Pengguna Internet Di Indonesia Awal 2022*, 2022 <https://databoks.katadata.co.id/datapublish/2022/03/23/ada-2047-juta-pengguna-internet-di-indonesia-awal-2022> [accessed 7 December 2022]

Ante, Lennart, 'How Elon Musk's Twitter Activity Moves Cryptocurrency Markets', *Technological Forecasting & Social Change*, 186.122112 (2023) https://doi.org/10.1016/j.techfore.2022.122112

Antikowati, A., Ulum, M. B., Soetijono, I. R., & Nugraha, R. W., 'Globalisation and Indonesia's Demand for Dual Citizenship_ Problems and Alternatives', *Legality : Jurnal Ilmiah Hukum*, 31.1 (2023), 42–58 https://doi.org/https://doi.org/10.22219/ljih.v31i1.24683

Aslanidis, Nektarios, Aurelio F. Bariviera, and López Óscar G., 'The Link between Cryptocurrencies and Google Trends Attention', *Finance Research Letters*, 47.102654 (2022), 1–8 https://doi.org/10.1016/j.frl.2021.102654

Auer, Raphael, and David Tercero-Lucas, 'Distrust or Speculation? The Socioeconomic Drivers of U.S. Cryptocurrency Investments', *Journal of Financial Stability*, 62.101066 (2022), 1–23 https://doi.org/10.1016/j.jfs.2022.101066

Bai, Yutong, Yang Liu, and Wee Meng Yeo, 'Supply Chain Finance: What Are The Challenges in The Adoption of Blockchain Technology?', *Journal of Digital Economy*, 1.3 (2022), 153–65 https://doi.org/10.1016/j.jdec.2022.12.002

Bappepti, *Aset Kripto* (Jakarta: Badan pengawas Perdagangan Berjangka Komoditi, 2020)

Bassey, Edidiong, Emer Mulligan, and Ojo Adegboyega, 'A Conceptual Framework for Digital Tax Administration - A Systematic Review', *Government Information Quarterly*, 39.101754 (2022), 1–15 https://doi.org/10.1016/j.giq.2022.101754

Bhimani, Alnoor, Kjell Hausken, and Sameen Arif, 'Do National Development Factors Affect Cryptocurrency Adoption?', *Technological Forecasting and Social Change*, 181.August 2021 (2022), 121739 https://doi.org/10.1016/j.techfore.2022.121739

Borri, Nicola, and Kirill Shakhnov, 'Regulation Spillovers across Cryptocurrency Markets', *Finance Research Letters*, 36.July 2019 (2020), 101333 https://doi.org/10.1016/j.frl.2019.101333

Briola, Antonio, David Vidal-Tomás, Yuanrong Wang, and Tomaso Aste, 'Anatomy of a Stablecoin's Failure: The Terra-Luna Case', *Finance Research Letters*, 51.103358 (2023), 1–13 https://doi.org/10.1016/j.frl.2022.103358

Chang, Soonpeel Edgar, 'Legal Status of Cryptocurrency in Indonesia and Legal Analysis of the Business Activities in Terms of Cryptocurrency', *Brawijaya Law Journal*, 6.1 (2019), 76–93 http://dx.doi.org/10.21776/ub.blj.2019.006.01.06

Charfeddine, Lanouar, Noureddine Benlagha, and Youcef Maouchi, 'Investigating The Dynamic Relationship between Cryptocurrencies and Conventional Assets: Implications for Financial Investors', *Economic Modelling*, 85 (2020), 198–217 https://doi.org/10.1016/j.econmod.2019.05.016

CoinMarketCap, 'Today's Cryptocurrency Prices by Market Cap', 2022 <https://coinmarketcap.com/> [accessed 7 December 2022]

Díaz, Antonio, Carlos Esparcia, and Diego Huélamo, 'Stablecoins as a Tool to Mitigate the Downside Risk of Cryptocurrency Portfolios', *North American Journal of Economics and Finance*, 64.101838 (2023), 1–26 https://doi.org/10.1016/j.najef.2022.101838

Fernandes, Leonardo H.S., Elie Bouri, José W.L. Silva, Lucian Bejan, and Fernando H.A. de Araujo, 'The Resilience of Cryptocurrency Market Efficiency to COVID-19

Shock', *Physica A*, 607.128218 (2022), 1–8 https://doi.org/10.1016/j.physa.2022.128218

Ferreira, Agata, and Philipp Sandner, 'EU Search for Regulatory Answers to Crypto Assets and Their Place in the Financial Markets' Infrastructure', *Computer Law and Security Review*, 43.105632 (2021), 1–15 https://doi.org/10.1016/j.clsr.2021.105632

Florea, Elena S., and Evgheni Pustelnik, 'On Regulation of Cryptocurrency: International Experience', *International Scientific Journal, Supremacy of Law*, 1.1 (2021), 69–83 https://doi.org/10.52388/2345-1971.2021.1.06

Gonzálvez-Gallego, Nicolás, and Concepción María Pérez-Cárceles, 'Cryptocurrencies and Illicit Practices: The Role of Governance', *Economic Analysis and Policy*, 72 (2021), 203–12 https://doi.org/10.1016/j.eap.2021.08.003

Goodell, John W., Ilan Alon, Chiaramonte Laura, Alberto Dreassi, Andrea Paltrinieri, and Stefano Piser`a, 'Risk Substitution in Cryptocurrencies: Evidence from BRICS Announcements', *Emerging Markets Review*, 100938, 2022, 1–17 https://doi.org/10.1016/j.ememar.2022.100938

Gowda, Nandan, and Chandrani Chakravorty, 'Comparative Study on Cryptocurrency Transaction and Banking Transaction', *Global Transitions Proceedings*, 2.2 (2021), 530–34 https://doi.org/10.1016/j.gltp.2021.08.064

Howson, Peter, and Alex de Vries, 'Preying on the Poor? Opportunities and Challenges for Tackling the Social and Environmental Threats of Cryptocurrencies for Vulnerable and Low-Income Communities', *Energy Research & Social Science*, 84.102394 (2022), 1–9 https://doi.org/10.1016/j.erss.2021.102394

Howson, Peter, and Alex de Vries, 'Preying on the Poor? Opportunities and Challenges for Tackling the Social and Environmental Threats of Cryptocurrencies for Vulnerable and Low-Income Communities', *Energy Research and Social Science*, 84.August 2021 (2022), 102394 https://doi.org/10.1016/j.erss.2021.102394

Jalan, Akanksha, Roman Matkovskyy, Andrew Urquhart, and Larisa Yarovaya, 'The Role of Interpersonal Trust in Cryptocurrency Adoption', *Journal of International Financial Markets, Institutions & Money*, 2022, 1–58 https://doi.org/10.1016/j.intfin.2022.101715

Jati, Hardian Satria, and Ahmad Arif Zulfikar, 'Transaksi Cryptocurrency Perspektif Hukum Ekonomi Syariah', *Jurnal Al-Adalah : Jurnal Hukum Dan Politik Islam*, 6.2 (2021), 137–48 https://doi.org/10.35673/ajmpi.v6i2.1616

Jaya, Robert Muliawan, Valentino Dhamma Rakkhitta, Pranata Sembiring, Ivan Sebastian Edbert, and Derwin Suhartono, 'Blockchain Applications in Drug Data Records', *Procedia Computer Science*, 216 (2023), 739–48 https://doi.org/10.1016/j.procs.2022.12.191

Karim, Ridoan, and Farahdilah Ghazali, 'Renewable Energy Regulations in Indonesia and India_ A Comparative Study on Legal Framework', *Journal of Indonesian Legal Studies*, 5.2 (2021), 361–90 https://doi.org/https://doi.org/10.15294/jils.v5i2.41986

Karim, Sitara, Brian M. Lucey, Muhammad Abubakr Naeem, and Samuel A. Vigne, 'The Dark Side of Bitcoin: Do Emerging Asian Islamic Markets Help Subdue the Ethical

Risk?', *Emerging Markets Review*, 54.January 2022 (2023), 100921 https://doi.org/10.1016/j.ememar.2022.100921

Katsiampa, Paraskevi, Larisa Yarovaya, and Damian Zięba, 'High-Frequency Connectedness between Bitcoin and Other Top-Traded Crypto Assets during The COVID-19 Crisis', *Journal of International Financial Markets, Institutions & Money*, 79.101578 (2022), 1–29 https://doi.org/10.1016/j.intfin.2022.101578

Lee, Seung Ah, and George Milunovich, 'Digital Exchanges Attributes and the Risk of Closure', *Blockchain: Research and Applications*, 100131, 2023 https://doi.org/10.1016/j.bcra.2023.100131

Li, Yi, Brian Lucey, and Andrew Urquhart, 'Can Altcoins Act as Hedges or Safe-Havens for Bitcoin?', *Finance Research Letters*, 103360, 2022, 1–6 https://doi.org/10.1016/j.frl.2022.103360

Marthinsen, John E., and Steven R. Gordon, 'Hyperinflation, Optimal Currency Scopes, and a Cryptocurrency Alternative to Dollarization', *Quarterly Review of Economics and Finance*, 85 (2022), 161–73 https://doi.org/10.1016/j.qref.2020.12.007

Mikhaylov, Alexey, 'Cryptocurrency Market Analysis from the Open Innovation Perspective', *Journal of Open Innovation: Technology, Market, and Complexity*, 6.197 (2020), 1–19 https://doi.org/10.3390/joitmc6040197

Muslih, M., & Supeno, S., 'Financial Technology_ Digital Legal Challenges and Indonesia's Economic Prospects after Covid-19 Outbreak', *Legality: Jurnal Ilmiah Hukum*, 30.2 (2021), 255–266 https://doi.org/https://doi.org/10.22219/ljih.v30i2.22784

Mzoughi, Hela, Ramzi Benkraiem, and Khaled Guesmi, 'The Bitcoin Market Reaction to The Launch of Central Bank Digital Currencies', *Research in International Business and Finance*, 63.101800 (2022), 1–9 https://doi.org/10.1016/j.ribaf.2022.101800

Narayan, Paresh Kumar, Seema Narayan, R. Eki Rahman, and Iwan Setiawan, 'Bitcoin Price Growth and Indonesia's Monetary System', *Emerging Markets Review*, 38.November 2018 (2019), 364–76 https://doi.org/10.1016/j.ememar.2018.11.005

Nitha, Dewa Ayu Fera, and I Ketut Westra, 'Investasi Cryptocurrency Berdasarkan Peraturan Bappebti No. 5 Tahun 2019', *Jurnal Magister Hukum Udayana (Udayana Master Law Journal)*, 9.4 (2020), 712–22 https://doi.org/10.24843/JMHU.2020.v09.i04. p04

Park, Danny, 'South Korea's All-Encompassing Crypto Law Is Coming — What We Know So Far', 2022 <https://forkast.news/south-korea-crypto-law-what-we-know-so-far/> [accessed 7 December 2022]

Pi˜neiro-Chousa, Juan, M. ´Angeles L´opez-Cabarcos, Aleksandar Sevic, and Isaac Gonz´alez- L´opez, 'A Preliminary Assessment of The Performance of DeFi Cryptocurrencies in Relation to Other Financial Assets, Volatility, and User-Generated Content', *Technological Forecasting & Social Change*, 181.121740 (2022), 1–8 https://doi.org/10.1016/j.techfore.2022.121740

Rahmayati, 'Strengthening Islamic Banking Services in Indonesia Through Blockchain Technology: The Anp-Step Approach', *At-Tijaroh: Jurnal Ilmu Manajemen Dan Bisnis Islam*, 7.2 (2021), 259–72 https://doi.org/10.24952/tijaroh.v6i2.2453

Raza, Syed Ali, Komal Akram Khan, Khaled Guesmi, and Ramzi Benkraiem, 'Uncertainty in The Financial Regulation Policy and The Boom of Cryptocurrencies', *Finance Research Letters*, 52.103515 (2023), 1–6 https://doi.org/10.1016/j.frl.2022.103515

Sánchez-Núñez, Pablo, and Yolanda García Calvente, 'Tax Regulation on Blockchain and Cryptocurrency: The Implications for Open Innovation', *Journal of Open Innovation: Technology, Market, and Complexity*, 7.98 (2021), 1–21 https://doi.org/10.3390/joitmc7010098

Sanka, Abdurrashid Ibrahim, Muhammad Irfan, Ian Huang, and Ray C.C. Cheung, 'A Survey of Breakthrough in Blockchain Technology: Adoptions, Applications, Challenges and Future Research', *Computer Communications*, 169.March 2020 (2021), 179–201 https://doi.org/10.1016/j.comcom.2020.12.028

Siswantoro, Dodik, Rangga Handika, and Aria Farah Mita, 'The Requirements of Cryptocurrency for Money, an Islamic View', *Heliyon*, 6.1 (2020), e03235 https://doi.org/10.1016/j.heliyon.2020.e03235

Supriyadi, Daniar, 'The Regulation of Personal and Non-Personal Data in the Context of Big Data', *Journal of Human Rights, Culture and Legal System*, 3.1 (2023), 33–69 https://doi.org/10.53955/jhcls.v3i1.71

Toufaily, Elissar, 'An Integrative Model of Trust toward Crypto-Tokens Applications: A Customer Perspective Approach', *Digital Business*, 2.2 (2022), 100041 https://doi.org/10.1016/j.digbus.2022.100041

Triasari, Devi, Willy Naresta Hanum, and Viddy Firmandiaz, 'Mapping Restorative Justice in Information and Electronic Transaction Criminal Regulation', *Journal of Human Rights, Culture and Legal System*, 3.1 (2023), 1–16 https://doi.org/https://doi.org/10.53955/jhcls.v3i1.75

Wei, Yu, Yizhi Wang, Brian M. Lucey, and Samuel A. Vigne, 'Cryptocurrency Uncertainty and Volatility Forecasting of Precious Metal Futures Markets', *Journal of Commodity Markets*, 29.100305 (2022), 1–16 https://doi.org/10.1016/j.jcomm.2022.100305

Yeong, Yoon Chow, Khairul Shafee Kalid, K. S. Savita, M. N. Ahmad, and Maryam Zaffar, 'Sustainable Cryptocurrency Adoption Assessment among IT Enthusiasts and Cryptocurrency Social Communities', *Sustainable Energy Technologies and Assessments*, 52.PA (2022), 102085 https://doi.org/10.1016/j.seta.2022.102085

Yosef, Bonaparte, and Gennaro Bernile, 'A New "Wall Street Darling?" Effects of Regulation Sentiment in Cryptocurrency Markets', *Finance Research Letters*, 103376, 2022, 1–10 https://doi.org/10.1016/j.frl.2022.103376

Yu, Zhixiu, 'On the Coexistence of Cryptocurrency and Fiat Money', *Review of Economic Dynamics*, 2022, 1–34 https://doi.org/10.1016/j.red.2022.08.001