

## **LEGALITY: JURNAL ILMIAH HUKUM**

Journal homepage: http://www.ejournal.umm.ac.id/index.php/legality

# Cryptocurrency Assets as Physical Collateral in Indonesia

Yohana Puspitasari Wardoyo<sup>1</sup>, Dwi Ratna Indri Hapsari<sup>2\*</sup>

#### Article

#### **Keywords:**

Cryptocurrency Assets; Physical Collateral; Indonesia

#### **Article History**

Received: Jan 2, 2023; Reviewed: Mar 8, 2023; Accepted: Apr 7, 2023; Published: Apr 10, 2023.

#### Abstract

Cryptocurrency investment is currently expanding quickly on a global scale as well as in Indonesia. On the one hand, cryptocurrency can be used as a medium of exchange or a form of money, which represents the original purpose of cryptocurrency. On the other hand, it can also be used as a commodity or as digital assets, also known as crypto assets. Cryptocurrency is illegal to use as money in Indonesia, but it is legal to exchange it as an asset. This study explores the legal protections for holders of collateral against the loss of crypto assets as well as how crypto assets are governed by material guarantees in Indonesia. A conceptual and statutory approach, technical analysis, and a normative legal research methodology were applied in the study. The legal material was analyzed by using the content analysis approach, which involved examining the content and legality of the material gleaned from various laws and regulations by looking at the relevant legal precedents. The discussion results discover that crypto assets fall under the definition of "intangible movable objects" as defined in article 503 BW. In addition, crypto assets had material rights in the form of material guarantees in the form of a pledge and fiduciary guarantees, allowing the parties to carry out their agreements in good faith even in the event that the collateral object is lost. These disputes could be settled through either non-litigation or litigation.



Copyright ©2023 by Author(s); This work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License. All writings published in this journal are personal views of the authors and do not represent the views of this journal and the author's affiliated institutions.

#### INTRODUCTION

Technology and science are developing quickly to assist human life's efficacy and efficiency (Aditya & Al-Fatih, 2020). In today's society, digitization is a need (Çipi, Fernandes, Ferreira, & Meidutė-Kavaliauskienė, 2023; Ramadhan, Murty, Nugraha, & Arifin, 2021). In the 5.0 age, technology has had a significant impact on all facets of human life, including the creation of the various financial options available

<sup>&</sup>lt;sup>12</sup> Faculty of Law, University of Muhammadiyah Malang, Malang, East Java, 65141, Indonesia

<sup>\*</sup> Corresponding Author: dwiratna@gmail.com

to investors (Khan, Haleem, & Javaid, 2023). In the previous era, we only knew investments in the form of capital participation, stocks, bonds, securities, property, and so on. However, in the current 5.0 era, technological disruption with human intelligence coupled with technological advances has given rise to a new instrument based on many users of digital assets such as cryptocurrency, NFT (Non-Fungible Token), and metaverse. Due to their extreme volatility, many have exploited these three digital assets as investments since they can yield higher returns than more traditional investments. Therefore, those who have made digital assets their primary investment vehicle may experience legal issues (Wildan, Milah, & Taufik, 2022).

In addition, there is bitcoin, a computer programmer's digital creation that can also be utilized in electronic transactions (Liu, Li, Li, Li, & Xie, 2021; Mzoughi, Benkraiem, & Guesmi, 2022). Bitcoin just exists as an electronic wallet in the form of an account, with no physical manifestation (e-wallet). As the overseer of Indonesia's monetary system, Bank Indonesia published a statement on November 6, 2014, declaring that Bitcoin cannot be used as a form of payment in Indonesia. To date, the number of members registered on the biggest exchange site in Indonesia, namely on the PT. Indodax Nasional Indonesia has reached 5.5 million. However, this call did not persuade its customers to stop using Bitcoin. Given that there were just 2.8 million Indodax subscribers in 2021, there has been a fairly noticeable increase (Mayasari, 2022). This proves that crypto is popular among Indonesian people, indicating that Indonesians are interested in cryptocurrency.

Due to the requirements set forth in Law Number 7 of 2011 Concerning Currency, which designates the rupiah as the sole official currency issued by the Unitary State of the Republic of Indonesia, the existence of cryptocurrencies in Indonesia cannot be used as a transactional tool simply because cryptocurrency does not meet the criteria as the currency that applies in Indonesia, as confirmed by Bank Indonesia Regulation Number 18/40/PBI/2016 Concerning Implementation of Payment Trans. Commodity Futures Trading Regulatory Agency Regulation Number 7 of 2020 concerning the Establishment of Lists of Crypto Assets that Can be Traded on the Physical Crypto Asset Market was issued by the Ministry of Trade through BAPEPPTI (Badan Pengawas Perdagangan Berjangka Komoditi/Commodity Futures Trading Regulatory Agency), despite the fact that it cannot be used as a transactional tool for cryptocurrency assets.

Cryptocurrency trading in several countries, especially ASEAN countries, publishes actively on the exchange market. All ASEAN member countries allow cryptocurrency trading and it is recorded that only Singapore imposes taxes. Regulation and supervision of cryptocurrencies as a payment method are considered to be very weak. Thus, without definite regulation and supervision, it can create opportunities for cryptocurrencies to be used as a means of tax evasion, money laundering, and terrorist financing(Laksono & Nugraha, 2021). Cryptocurrency management requires the

cooperation of various other countries because it has the potential to cause an explosion of economic bubbles that can shake financial stability.

In fact, current technological advances which then force people to make transactions also follow digitization. Several companies such as Amazon, Microsoft, Axa Insurance, Tesla, Apple, Coca—cola, Starbucks, and so on have accepted payments using Bitcoin (David, 2021). Crypto assets are quite risky for investment if the volatility is high and without clear cryptocurrency regulations. Without adequate experience in the world of cryptocurrencies but with interest in investing in large amounts and even selling real assets to make loans to banks for investment, investors are prone to huge losses as not many exchanges implement the know-your-customer protocol to prevent this glitch. On the contrary, experienced investors will buy at low prices and sell at high prices by taking advantage of market conditions. It is not yet clear about regulations, especially regarding taxes, so it is potential for investors who exchange very high amounts of fiat currency to be tax-free.

Cryptocurrency regulation in Singapore does not differentiate transactions in fiat and cryptocurrencies (Afzal, 2019). Singaporean citizens can use cryptocurrency as a payment method but are still subject to taxes. Payment Service Act of 2019 (PSA 2019), a regulation in Singapore, applies anti-money laundering and combating terrorism to exchange intermediaries. Thailand makes regulations similar to Singapore, namely the imposition of taxes as an effort to prevent money laundering and tax evasion by requiring companies to provide transaction information and the names of buyers and sellers (Gohwong, 2018). On the other hand, Vietnam (Dang, 2019), Laos, Myanmar, and Brunei Darussalam (Laksono & Nugraha, 2021) still have no clear regulations while the Philippines is still planning to make regulations. Cambodia is an ASEAN country that has its own cryptocurrency. In March 2018, Men Sam An, Cambodia's Deputy Prime Minister, announced the launch of Entapay (Prasad, 2018); however, the overall regulation regarding cryptocurrencies is also unclear. Like Indonesia, Malaysia (Ku-Mahamud, Bakar, & Omar, 2018) does not recognize cryptocurrencies as payment. Differences in regulation regarding Cryptocurrency in ASEAN countries are elaborated on in the following table.

Table 1 Cryptocurrency Regulation in ASEAN Countries

Two is of productions of the galacter in the lattice of the countries	
Country	Policy / Regulation
Indonesia	does not recognize cryptocurrency as a
	currency but recognizes it as an asset
Malaysia	does not recognize cryptocurrency as a
	currency but recognizes it as an asset
Singapore	recognizes crypto as currency and payment
	(PSA 2019)
Thailand	recognizes crypto as currency and payment

Philippines	plans to make regulations
Vietnam	still has no clear regulations
Laos	still has no clear regulations
Myanmar	still has no clear regulations
Brunei Darussalam	still has no clear regulations
Cambodia	Cambodia has a cryptocurrency called entapay
Timor Leste	Has not regulated crypto yet

Source: author(s), 2023

China strictly prohibits anything related to cryptocurrencies (Riley, 2021), blocks Bitcoin and websites, and disables citizens from accessing cryptocurrencies and trading assets on digital platforms. However, unlike China, South Korea does not prohibit cryptocurrencies but only allows trading from banks under real-name accounts to crack down on the anonymity and illegal use of cryptocurrencies.

Japan in cryptocurrency investment is the only ASEAN country that has proper regulation (Shirakawa & Korwatanasakul, 2019) by legalizing cryptocurrency as a payment instrument and regulating cryptocurrency exchanges subject to anti-money laundering rules and know-your-customer principle (Laksono & Nugraha, 2021). Crypto assets or cryptocurrencies, according to Jake Frankenfield, are digital currencies that use cryptography as security. Information and communication routes are protected using codes in a process called cryptography. Since cryptography is used, it is impossible to manipulate cryptocurrencies. As a result, cryptocurrency transactions are unfalsifiable (Sudiyatna, 2022).

While cryptocurrency assets are intangible commodities that take the form of digital assets that use cryptography, peer-to-peer networks and distributed ledgers are to manage the creation of new units, verify transactions, and secure transactions without outside interference, according to Article 1 Point 7 of the Commodity Futures Trading Regulatory Agency Regulation Number 5 of 2019 concerning Technical Provisions for Organizing the Physical Crypto Asset on Futures Exchanges.

BAPPEBTI, in general, reported that in October 2021, there were 9.5 million investors in crypto assets in Indonesia, up from 7.4 million in July. This indicates the rise in cryptocurrency transactions by Indonesians due to a change in the Indonesian population's outlook from prior investing in equities, gold, or mutual funds. The Republic of Indonesia's Minister of Trade's Regulation No. 99 of 2018 concerning General Policy for Organizing Crypto Asset Trading defines crypto assets as commodities that may be the subject of futures contracts traded on futures exchanges, increasing public interest in crypto asset trading in Indonesia. People in Indonesia determined the legitimacy of trading cryptocurrencies as crypto assets, which had an

impact on the growth of the cryptocurrency industry overall and in Indonesia in particular.

Ripples, RonPaulCoin, Litecoin, Ethereum, and Bitcoin are just a few of the more than 100 different types of cryptocurrencies that exist today, where Bitcoin is the predominant money used worldwide. Due to a number of characteristics, including the lack of central authority, ease of use, and affordable transaction costs, the presence of Bitcoin as a virtual currency has attracted considerable attention worldwide (Dwi Kurniawan, Sasono, Septiningsih, Santoso, & Rustamaji, 2021).

When it comes to assets, the idea of digital assets, such as crypto assets, as a thing with value in commerce, already having legal status, and being used by the general public, does not preclude the potential that it might be used as a guarantee. Regarding closed things, material guarantees are governed by *Burgerlijk Wetboek* (BW) book II. The material concept referred to is only confined to what is included in the BW because Book II of the BW is a closed book. On the other hand, as technology and information advance and the demands of the community change, business needs also adapt. This is true for both business transactions and business objects (Rahman, Sudarmanto, & Widayati, 2020). The author highlights the following legal concerns in light of this phenomenon: How are crypto assets governed in Indonesia's material guarantees; and What legal protection exists to protect holders of collateral from the theft of cryptographic assets.

#### **METHOD**

During the research process, there are steps or procedures known as legal research methods that are deemed to be effective and efficient (Ansari & Negara, 2023; Lubis & Simanjuntak, 2022). In a normative legal study, written laws are examined from a variety of angles, including theory, philosophy, comparison, structure or composition, consistency, general explanation and article-by-article explanation, formality and binding power of law, and the language of the study is Indonesian law. Thus, it may be inferred that the fields of normative legal research are relatively vast, comprising MH Normative, Empirical Research Studies, Proposal Writing, Thesis Reports and Thesis, Muhammad Syahrum, ST. Introduction to Legal Research Methods, Pe Print, ed. Irfan Marhani (Riau: DOTPLUS Publisher, 2022). The goal of legal research was to ascertain the existence or lack of legal norms that apply to a given action. The approach utilized to analyze the legal materials was content analysis, which involves examining the validity and content of information gleaned from various laws and regulations by looking at the governing legal standards. In this instance, the author employed normative legal research to examine Indonesian laws governing crypto assets in material guarantees and various legal protection for holders of collateral against the loss of crypto assets.

#### **RESULTS AND DISCUSSION**

Material warranties for closed objects are governed by *Burgerlijk Wetboek* (BW) book II. The material idea alluded to is solely limited to what is written in the BW or the Civil Code due to Book II of the BW's closed character. On the other hand, business requirements follow the advancement of technology and information from business transactions and objects that expand in response to community needs. People's demands to shift to digital mode extensively in the digital age for economic transactions are because it is simpler and more effective. The advent of cryptocurrency or bitcoin as a digital good or as a tool for digital transactions has not been formally regulated in Indonesia; rather, crypto assets are recognized as commodities (Syahrul Sajidin, 2021) All products, including those that can be traded and that can give rise to futures contracts, sharia derivative contracts, and/or other derivative contracts, are considered commodities (Kusuma, 2019).

The idea of a digital asset with commercial value, existing legality, and being used by the general public does not preclude the potential of it being used as a guarantee because positive law does not yet regulate the collateral items associated with digital assets as collateral and assets do not yet have legal certainty in commercial activities as the subject of guarantees (Jaya Wardana, Jaya Wardana, & Bachtiar, 2022; Krisnawangsa, Hasiholan, Adhyaksa, & Maspaitella, 2021). Material assurances are "material" in the sense that they grant primary rights over specific objects and have innate qualities that accompany the objects in question. The major categories recognized in BW, as per Civil Law, are as follows:

- 1. Tangible and intangible objects;
- 2. Movable and immovable objects;
- 3. Consumable and non-consumable objects;
- 4. Tradeable and non-tradeable objects;
- 5. Existing objects and things that will continue to exist;
- 6. Divisible and indivisible objects;
- 7. Replaceable and irreplaceable objects.

The Indonesian Ulema Council (MUI), one of the largest ulema bodies in Indonesia, issued a fatwa declaring that the use or various activities that use cryptocurrencies are haram. This is due to uncertainty and the potential for gambling in its use. However, the legal provisions regarding cryptocurrency based on the 7th Fatwa Commission of the MUI have a value, the amount is known with certainty, property rights, and can be handed over to the buyer. Cryptocurrency is a commodity/asset that fulfills the requirements of a Sil'ah and has underlying and clear legal benefits to be traded (Harahap, Anggraini, & Asmuni, 2022). Besides cryptocurrency conventions, there are also Islamic Sharia-based cryptocurrencies that are guaranteed by assets in the form of gold, namely Onegram and X8X (Rizvi & Ali, 2022).

A digital asset, on the other hand, is an object that exists in an electronic system and has value, and can be owned and controlled by both natural persons and legal entities. Digital assets are a sort of evolution from the idea of assets, which were first only found in the real world but have developed into the digital world. Additionally, digital assets are tangible objects whose ownership is digitally documented and which the owner has direct authority over. According to Article 1332 BW, only trade-related items can be the subject of a guarantee agreement; non-trade-related items are not eligible to be the subject of a guarantee agreement. These prerequisites are cumulative rather than alternative.

According to Article 503 BW, the digital currency has no physical form. Crypto assets are digital assets viewed from the perspective of material law including movable but intangible objects, seeing their character and nature that are easily followed by the owner's will or easily moved to handle it digitally. Based on its characteristics and how it functions, crypto assets are classified as movable objects because their ownership is stored digitally. Digital assets can be kept on servers and devices that use technology, and they can also be moved from one wallet to another across networks and the internet. Thus, crypto assets can satisfy an object's requirements even though they have not yet been subject to regulation under collateral law.

Didid Noordiatmoko, an acting head of BAPPEBTI in a press conference, said that the total registered customers of crypto assets increased from 11.2 million in 2021 to 16.55 million in 2022. This proves that crypto is still recognized and trusted as an asset according to research results from the Center of Economics and Law Studies (Celios) showing that crypto assets are one of the three main investment products in Indonesia (Putri & Hidayat, 2023). As many as 90% are millennials aged 20-30 years. Deputy Minister of Trade Jerry Sambuaga conveyed a number of reasons for the millennial generation to be enthusiastic about crypto trading. This is based on studies and discussions with various communities. He said, one of the reasons is that transactions have no limits. Then, another thing that also influences many younger generations of crypto asset transactions is that many celebrities, artists, musicians, and community leaders share their crypto asset transaction activities via social media (Gagas, 2022).

Cryptocurrency assets still run the risk of being lost due to theft or hacking by those with the ability to do so and commit cybercrimes despite the fact that crypto technology is smart and advanced. Cybercrime uses advanced computer and telecommunications technology to carry out its operations (Imanda, 2020). Aside from the effects of cybercrime, demands from the project team or asset team, as well as the failure of crypto asset dealers to adhere to legal terms and conditions, can result in the deletion of crypto assets. Delisting refers to the removal of these crypto assets, and it can unquestionably result in a decline in the legitimacy and public confidence in traded crypto assets.

Mortgage (Hidayah, Anggraeny, & Hapsari, 2020) and fiduciary (Isdian et al., 2021) are examples of substantial guarantees that could be billed to crypto assets. Legal assurance for debt repayment in a debt agreement or certainty of fulfillment in a debtor-creditor agreement is what the guarantee's role in the law is. It does not completely rule out the potential that collateral objects using cryptocurrency could be lost due to cybercrime or delisting. The collateral charges that can be applied to crypto assets as collateral objects are mortgage and fiduciary guarantees. The right to pledge collateral is regulated in Article 1152 BW "The lien on tangible movable goods and receivables arises by submitting the pledge to the power of the creditor or the person who gives the pledge or is returned at the will of the creditor", so that crypto assets are in the possession of the creditor.

It is not in violation of Article 1152 BW if a pledge is required since the manager of the facility where crypto assets are housed has proof of preserving ownership. But if the holder of the collateral locks the cryptocurrency so that it cannot be moved and a power of attorney is issued for the payment to the creditor in the event of a default by the debtor, (Wibowo, 2022) according to article 1157 (1) BW, the creditor must bear responsibility for the pledge item's loss if it was caused by their carelessness. However, the collateral recipient is exempt from the obligation to replace the pledged property if it is lost or damaged due to a force majeure.

The Law No. 42 of 1996 Concerning Fiduciary Guarantees (UUJF), which governs the concept of fiduciary guarantees, states that a fiduciary transfer of ownership rights to an object is based on trust, provided that the object whose ownership rights are transferred remains under the control of the object's owner (Putri Hidayah & ., 2022). Naturally, a Crypto Asset must be registered in accordance with Government Regulation Number 21 of 2015 concerning Procedures for Registration of Fiduciary Guarantees and Regulation of the Minister of Law and Human Rights No. 9 of 2013 concerning Enforcement of Electronic Fiduciary Registration where a Fiduciary Deed must be made by a Notary and registered with Fiduciary Registration Office. Fiduciary guarantees are imposed in the event of default, but because the collateral item is lost, creditors find it challenging to execute or sell at auction. On the other side, even while the cryptocurrency asset is still present, the owner of the collateral will still be able to pay the creditor even if the debtor loses the item if the owner does not offer a wallet. This refers to the application of the good faith principle as stated in article 1338 (3) BW, which provides that parties to an agreement must do so in good faith, particularly while abiding by decency and decency standards to ensure that neither party is harmed. Fiduciary guarantees include insurance claims, according to Article 10 Letter (b) of the UUJF, in the event that the things covered by fiduciary guarantees are insured. However, OJK (OJK, 2022) forbids financial service providers like banks, insurance companies, and multi-finance to facilitate cryptocurrency activities, ranging from marketing to facilitating trading of cryptocurrency assets.

Based on the occurrences, legal protection is required for the collateral holder, in this example the creditor, in the event that the crypto asset is lost. There are two types of legal protection; the first is preventative legal protection, which entails preventing violations from happening in the first place by fortifying a defense offered by the government to the general public. Statutory regulations that include prohibitions, mandates, and fines contain this type of protection. The next type of legal protection is repressive legal protection, in the meantime. If a violation has taken place, the law will provide protection by imposing penalties, which may include fines, jail time, or the loss of certain privileges.

The idea of law, in the opinion of Mahadi, is a collection of standards that govern social behavior (Mahadi, 2007). Soedjono Dirdjosisworo (Dirdjosisworo, 2008) claims that there are eight possible interpretations of what the word "law" means, including "law" in the sense of rulers, "law" in the sense of officials, "law" in the sense of action, "law" in the sense of a set of rules, "law" in the sense of a web of values, "law" in the meaning of the legal system, and "law" in the meaning of the "science of law" and "law. According to Philip M. Hadjon, legal protection is always connected to power in terms of legal protection (Hadjon, 2002). Both governmental and economic power exists in two. The question of legal protection for the governed versus the ruling government in connection to government authority. The topic of legal protection in connection to economic power is protection for the economically disadvantaged against the economically powerful, such as protection for employees against employers (Moertiono, 2021).

In the future, crypto asset trading is part of the digital economy in Indonesia which will grow rapidly. The data from BAPEPPTI shows that in the last five months, the number of crypto investors in Indonesia has continued to grow. Crypto asset trading transactions in Indonesia are back on track as the market increases. This shows the positive prospects for the development of crypto assets. However, this must be accompanied by increased public literacy and collaboration between regulators, associations, and crypto asset trading industry participants.

Currently, the parties are not guaranteed legal protection simply because there are restrictions governing crypto investing. Particularly for collateral owners if crypto assets are lost due to a mortgage default or a breach of fiduciary duty. The collateral holder should conduct due diligence on the crypto assets that will be used as collateral before accepting them, especially in terms of their legality. In addition, it is important to take the risk of fluctuating crypto assets into account. Keeping in mind that the collateral holder may suffer if there is a default, the value of crypto assets should not decline. In addition, by prioritizing non-litigation agreements with the debtor, the settlement can also be completed through litigation if the debtor does not react.

### **CONCLUSION**

Crypto assets potentially meet the criteria for an object as defined by the Civil Code, namely as an intangible movable property, but they have not yet been governed in terms of collateral law. Liens and fiduciary assurances are the forms of collateral imposition of these crypto assets that are most likely to occur. The fact that it is in digital form does not preclude the chance that these assets could be lost as a result of theft or delisting. In the event that the collateral is lost, the creditor is liable to the extent that this was due to their fault. The collateral recipient is exempt from having to buy a replacement if the pledged collateral object is destroyed or lost due to a force majeure. Fiduciary guarantees, on the other hand, require the debtor to continue fulfilling their performance obligations to the creditor even if assets are lost. In theory, both parties should act in good faith when enforcing the agreement. Due to their digital form and erratic nature, crypto assets that will be utilized as collateral items must also be well-researched in advance by collateral holders in order to reduce potential losses.

#### REFERENCES

- Aditya, Z. F., & Al-Fatih, S. (2020). Indonesian constitutional rights: expressing and purposing opinions on the internet. *International Journal of Human Rights*, 0(0), 1–25. https://doi.org/10.1080/13642987.2020.1826450
- Afzal, A. (2019). Cryptocurrencies, Blockchain and Regulation: A Review. *The Lahore Journal of Economics*, 24(1), 103–130. https://doi.org/10.35536/lje.2019.v24.i1.a5
- Ansari, T., & Negara, S. (2023). Normative Legal Research in Indonesia: Its Originis and Approaches. *Audito Comparative Law Journal (ACLJ)*, 4(1), 1–9. https://doi.org/10.22219/ACLJ.V4I1.24855
- Çipi, A., Fernandes, A. C. R. D., Ferreira, F. A. F., Ferreira, N. C. M. Q. F., & Meidutė-Kavaliauskienė, I. (2023). Detecting and developing new business opportunities in society 5.0 contexts: A sociotechnical approach. *Technology in Society*, *73*, 102243. https://doi.org/10.1016/J.TECHSOC.2023.102243
- Dang, T. T. (2019). Current Situation of Cryptocurrency in Vietnam. *Journal of Business Economics and Environmental Studies*, 9(4), 29–34. https://doi.org/10.13106/jbees.2019.vol9.no4.29
- David, W. (2021, December). Paying with Bitcoin: These are the major companies that accept crypto as payment. Retrieved April 15, 2023, from Euronews.Next website: https://www.euronews.com/next/2021/12/04/paying-with-cryptocurrencies-these-are-the-major-companies-that-accept-cryptos-as-payment
- Dirdjosisworo, S. (2008). Pengantar Ilmu Hukum. Jakarta: PT Raja Grafindo Persada.
- Dwi Kurniawan, I., Sasono, S., Septiningsih, I., Santoso, B., & Rustamaji, M. (2021). Transformasi Penggunaan Cryptocurrency Melalui Bitcoin Dalam Transaksi

- Komersial Dihubungkan Dengan Diskursus Perlindungan Hukum (Legal Protection) Konsumen Di Indonesia. *Jurnal Hukum Mimbar Justitia*, 7(1), 65–86. https://doi.org/10.35194/jhmj.v7i1.1886
- Gagas, Y. P. (2022). Alasan kripto makin populer di kalangan generasi milenial. Retrieved April 15, 2023, from Liputan6.com website: https://www.liputan6.com/crypto/read/4887621/alasan-kripto-makin-populer-di-kalangan-generasi-milenial
- Gohwong, S. (2018). The State of the Art of Cryptocurrencies. *Asian Administration and Management* Review, 1(2), 1–16. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract\_id=3269052
- Hadjon, P. M. (2002). *Introduction to Indonesian Administrative Law*. Yogyakarta: Gadja Mada University Press.
- Harahap, K., Anggraini, T., & Asmuni, A. (2022). Cryptocurrency Dalam Persfektif Syariah: Sebagai Mata Uang Atau Aset Komoditas. *Niagawan*, 11(1), 43. https://doi.org/10.24114/niaga.v11i1.32355
- Hidayah, N. P., Anggraeny, I., & Hapsari, D. R. I. (2020). Credit Dispute Resolution with Mortgage Right Warranties on Conventional Banking. Advance in Economics, Business and Management Research, 121(Inclar 2019), 24–28. https://doi.org/10.2991/aebmr.k.200226.005
- Imanda, N. (2020). Aset Kripto Sebagai Objek Lembaga Jaminan Gadai Dalam Praktik Peer-To-Peer Lending. Universitas Airlangga.
- Isdian, W., Fahmil, A., Fitria, U., Ratna, D., Hapsari, I., & Kusuma, I. (2021). Problems of the Execution of Fiduciary Guarantee Goods Which Unregistered by Finance Institutions. *Atlantis Press Press*, 590(42), 98–102. https://doi.org/10.2991/assehr.k.211102.175
- Jaya Wardana, D., Jaya Wardana, D., & Bachtiar, H. (2022). Public Participation in the Law-Making in the Digitalization Era. *Indonesia Law Reform Journal*, 2(3), 289–298. https://doi.org/10.22219/ILREJ.V2I3.23764
- Khan, M., Haleem, A., & Javaid, M. (2023). Changes and improvements in Industry 5.0: A strategic approach to overcome the challenges of Industry 4.0. *Green Technologies and Sustainability*, 1(2), 100020. https://doi.org/10.1016/J.GRETS.2023.100020
- Krisnawangsa, H. C., Hasiholan, C. T. A., Adhyaksa, M. D. A., & Maspaitella, L. F. (2021). Urgensi Pengaturan Undang-Undang Pasar Fisik Aset Kripto (Crypto Asset). *Dialogia Iuridica: Jurnal Hukum Bisnis Dan Investasi*, 13(1), 1–15. https://doi.org/10.28932/di.v13i1.3718
- Ku-Mahamud, K. R., Bakar, N. A. A., & Omar, M. (2018). Blockchain, cryptocurrency and Fintech market growth in Malaysia. *Journal of Advanced Research in Dynamical and Control Systems*, 10(14), 2074–2082. Retrieved from https://repo.uum.edu.my/id/eprint/27869/
- Kusuma, T. (2019). Cryptocurrency Dalam Perdagangan Berjangka Komoditi di

- Indonesia Perspektif Hukum Islam. ICOLEESS: International Conference on Language, Education, Economic and Social Science, 1(1), 275–293. Retrieved from https://www.proceedings.iaipd-nganjuk.ac.id/index.php/icoleess/article/view/40
- Laksono, H. T., & Nugraha, M. F. (2021). Cryptocurrency Fever: Should Southeast Asian Countries Cooperate on Facing Cryptocurrency Market? *Airlangga Conference on International Relations (ACIR 2018) Politics, Economy, and Security in Changing Indo-Pacific* Region, (Acir 2018), 324–330. https://doi.org/10.5220/0010276603240330
- Liu, F., Li, Y., Li, B., Li, J., & Xie, H. (2021). Bitcoin transaction strategy construction based on deep reinforcement learning. *Applied Soft Computing*, *113*, 107952. https://doi.org/10.1016/J.ASOC.2021.107952
- Lubis, M. M., & Simanjuntak, K. (2022). Analisis Hukum Penempatan Investasi yang Mengalami Kegagalan Pada Perusahaan Asuransi PT . Asabri (Persero). *Binamulia Hukum*, 11(1), 33–41. https://doi.org/10.37893/jbh.v11i1.672
- Mahadi. (2007). Falsafah Hukum: Suatu Pengantar. Bandung: Alumni.
- Mayasari, S. (2022). Indodax Catatkan Kenaikan Jumlah Investor Kripto Hingga 85% di Kuartal I-2022. Retrieved April 15, 2023, from Kontan.co.id website: https://investasi.kontan.co.id/news/indodax-catatkan-kenaikan-jumlah-investor-kripto-hingga-85-di-kuartal-i-2022
- Moertiono, R. J. (2021). Perjanjian Kredit Pemilikan Rumah dalam Perspektif Teori Perlindungan Hukum. *All Fields of Science J-LAS*, 1(3), 252–262. https://doi.org/10.58939/afosj-las.v1i3.109
- Muhammad Syahrum, ST., M. (2022). Pengantar Metode Penelitian Hukum, Kajian Penelitian Normatif, Empiris, Penulisan Proposal, Laporan Skripsi dan Tesis (Cetakan Pe; I. Marhani, Ed.). Riau: DOTPLUS Publisher.
- Mzoughi, H., Benkraiem, R., & Guesmi, K. (2022). The bitcoin market reaction to the launch of central bank digital currencies. Research in International Business and Finance, 63, 101800. https://doi.org/10.1016/J.RIBAF.2022.101800
- Prasad, E. (2018). Central Banking in a Digital Age: Stock-Taking and Preliminary Thoughts. In *Huchins Center on Fiscsl & Monetary Policy*. Retrieved from http://iepecdg.com.br/wp-content/uploads/2018/04/es\_20180416\_digitalcurrencies.pdf
- Putri Hidayah, N., & . K. (2022). The Urgency of Strengthening Creditor Legal Protection in Fiduciary Guarantee Agreements. *KnE Social Sciences*, 2022(1), 492–504. https://doi.org/10.18502/kss.v7i15.12123
- Putri, R. S., & Hidayat, A. A. N. (2023). Bappebti: Jumlah Pemilik Aset Kripto di Indonesia Naik tapi Transaksinya Merosot. Retrieved April 15, 2023, from tempo.co website: https://bisnis.tempo.co/read/1675666/bappebti-jumlahpemilik-aset-kripto-di-indonesia-naik-tapi-transaksinya-merosot
- Rahman, I., Sudarmanto, H. L., & Widayati, S. C. (2020). Kajian Yuridis Jaminan

- Kebendaan pada Digital Aset sebagai Objek Jaminan. *Jurnal Transparansi Hukum*, 03(02). https://doi.org/10.30737/transparansi.v3i2.2712
- Ramadhan, M. S., Murty, T., Nugraha, A., & Arifin, M. Z. (2021). Legitimasi Cryptocurrency (Mata Uang Digital) Sebagai Aset Korporasi. *Rechtidee*, 16(2), 246–266. https://doi.org/10.21107/ri.v16i2.11862
- Riley, J. (2021). The Current Status of Cryptocurrency around the World. *China & WTO Review*, 1, 135–152. https://doi.org/10.14330/cwr.2021.7.1.06
- Rizvi, S. A. R., & Ali, M. (2022). Do Islamic Cryptocurrencies Provide Diversification Opportunities To Indonesian Islamic Investors? *Journal of Islamic Monetary Economics and Finance*, 8(3), 441–454. https://doi.org/10.21098/jimf.v8i3.1563
- Shirakawa, J. B. R., & Korwatanasakul, U. (2019). Cryptocurrency Regulations: Institutions and Financial Openness. In *Journal of Asia-Pacific Studies* (No. 1). Retrieved from https://think-asia.org/handle/11540/10929
- Sudiyatna, Y. (2022). Perlindungan Hukum bagi Investor pada Transaksi Aset Kripto dalam Bursa Berjangka Komoditi. *Jatiswara*, *37*(2), 212. https://doi.org/10.20473/jd.v3i1.17638
- Syahrul Sajidin. (2021). LEGALITAS PENGGUNAAN CRYPTOCURRENCY SEBAGAI ALAT PEMBAYARAN DI INDONESIA. *Arena Hukum*, 14(2), 245–267. https://doi.org/10.21776/ub.arenahukum.2021.01402.3
- Wibowo, S. L. (2022). Penjaminan Utang dengan Crypto Asset.
- Wildan, A., Milah, M. S., & Taufik, M. (2022). Problematika Hukum Aset Digital Era Disrupsi 5.0 di Indonesia Melalui Pendekatan Legislasi. *Jurnal MAHUPAS: Mahasiswa Hukum Unpas*, 1(2), 67–88. Retrieved from https://journal.unpas.ac.id/index.php/mahupas/article/view/5720