

Dilemmas and Countermeasures in the Criminal Law System for Offences Involving Virtual Currencies

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Abstract: With the rapid development of science and technology, the new asset form of virtual currency has gradually entered people's vision. However, with its wide application, crimes involving virtual currency are also increasingly rampant, ranging from theft, fraud to money laundering and illegal fundraising. These criminal acts not only damage the legitimate rights and interests of investors, but also pose a serious threat to financial order and social stability. The increasingly prominent crimes involving virtual currency pose new challenges to the traditional legal system. The anonymity and decentralization of virtual currency make criminal acts more concealed and cross-border, which undoubtedly increases the difficulty of legal supervision and crackdown. This paper uses literature analysis, case studies, logical reasoning, and other research methods to deeply explore the governance problems of crimes involving virtual currency. Aiming at the ambiguity of its legal attribute, the difficulty of value evaluation, the challenge of determining "knowingly" committing a crime, and the problem of criminal disposal, this paper proposes a series of targeted countermeasures, such as clarifying the legal attribute of virtual currency, building a standardized value evaluation system, accurately identifying "knowingly", and improving the criminal disposal procedures of virtual currency involved in the case, expecting to contribute to building a safer and more stable virtual currency market environment and providing a strong guarantee for the healthy development of the digital economy.

Keywords: Virtual currency, Criminal governance, Legal attributes, Knowingly determining, Criminal disposition

1. Introduction

Virtual currencies, specifically digital cryptocurrencies based on blockchain technology, such as Bitcoin and Ethereum. These currencies do not rely on any centralised institution or government to issue them, but rather use cryptography and decentralised networks to protect the security and anonymity of transactions. Governments vary in their legal status and regulatory approach to such currencies, with some countries banning or restricting their use, while others have a more open attitude. This paper specifically refers to virtual currencies in a narrow sense, defined as digital cryptocurrencies decentralised and based on blockchain technology.

Virtual currency has the core features of decentralisation, global circulation, anonymity and non-tamperability. It makes use of decentralised blockchain technology to ensure that there is no fixed issuance centre and that all transaction records and issuance quantities remain open, transparent and

tamper-proof, which greatly enhances the security and credibility of transactions. Its global circulation feature breaks geographical restrictions, accelerates the free flow of funds, and simplifies the process of international trade and payment. Anonymity, on the other hand, provides users with transaction privacy protection, making the transaction process more secure and private. The encryption mechanism of public and private keys provides a solid guarantee for the authenticity and integrity of transactions, and strengthens the system's anti-attack and anti-tampering capabilities.

With the continuous advancement of digital technology, virtual currencies have become the new favourite in the global financial market. According to the data released by COINMARKETCAP, the world's largest virtual currency trading platform, the global cryptocurrency market capitalisation was US\$2.58 trillion as of 27 May 2024, and the total market capitalisation of cryptocurrencies has continued to grow in the first quarter of 2024, up 64.5% from the previous quarter. However, the problems hidden behind its rapid development are also becoming more prominent. According to data from China's Judgement and Documentation Network, the number of criminal cases involving virtual currencies is rising rapidly. So far, the total number of adjudication documents related to virtual currencies has reached 8,881. During the last five years (2020 to 2024) alone, the number of such cases is as high as 5,570, accounting for a large proportion of the total. This figure is alarming enough to reflect the increasing prevalence of virtual currency offences in recent years, and the governance of virtual currency offences is facing serious challenges.

In the face of this serious situation, this paper aims to provide theoretical support and practical guidance for combating and preventing such crimes by systematically sorting out the concepts and characteristics of crimes involving virtual currencies and the forms of their crimes, and by thoroughly analysing the governance dilemmas faced by the governance of virtual currency crimes, so as to put forward a series of targeted countermeasures.

2. Overview of Offences Involving Virtual Currencies

2.1. The Concept of Offences Involving Virtual Currencies

Virtual currency crimes refer specifically to those illegal acts that use virtual currencies (e.g., bitcoin, ethereum, etc.) as a tool, medium or target, often including theft, fraud, illegal fund-raising, money-laundering and so on. From a broader perspective, virtual currency crimes do not necessarily use real virtual currencies as tools or objects; in some cases, criminals carry out illegal and criminal activities with the help of virtual currency gimmicks and do not really use virtual currencies, and the author believes that such crimes should also be classified as crimes involving virtual currencies. This section must be in one column [1].

2.2. Characteristics

Virtual currency transactions are highly covert because of their anonymity, which makes it easy for criminals to hide their identities and carry out illegal activities, such as money-laundering and fraud, which undoubtedly poses a great challenge to law enforcement agencies. Its global circulation also provides conditions for criminals to commit transnational crimes, and they can easily circumvent geographical regulation and implement complex criminal schemes. Criminals also make use of encryption technology and blockchain to protect transaction records and identity information, making tracking and identification more difficult. They are often well versed in the manipulation of complex trading platforms and can even exploit technological loopholes to carry out attacks and undermine the security of the financial system. With the constant updating of criminal methods, they have adopted more sophisticated and covert ways to commit crimes, further enhancing the complexity of detection and combating.

2.3. Types of Offences

There are various types of crimes involving virtual currencies, and this article will analyse in detail several typical types of virtual currency crimes, with a view to providing useful references for the improvement of relevant laws and law enforcement practices.

2.3.1. Money-laundering Using Virtual Currencies

In the area of virtual currencies, this type of offence usually manifests itself by taking advantage of the anonymity of virtual currencies and the difficulty of tracing them to convert illicit proceeds into virtual currencies, which are then converted into legitimate assets through a complex chain of transactions.

Virtual currencies are extremely covert due to their anonymity, enabling traders to conduct transactions while protecting their identities, with algorithms dominating the entire process, and being able to avoid the monitoring of traditional regulators, with transaction tracks that are difficult to trace. Moreover, its global circulation and rapid transaction characteristics make huge sums of money can flow rapidly between countries without any obstacles. It has attracted many criminals to use virtual currencies to replace traditional currencies in the process of money laundering.

In the case of Chen Moubo's illegal fund-raising, his ex-wife Chen Moumou, knowing that the source of funds is illegal, not only did not report it to the relevant departments, but also actively assisted Chen Moubo in transferring some of the illegally gained funds abroad by means of bank transfers and Bitcoin exchanges in an attempt to evade the legal sanctions [2]. The Shanghai Pudong New Area People's Procuratorate dealt with this seriously, and Chen Moumou was sentenced to two years' imprisonment for money-laundering and fined RMB 200,000 yuan.

2.3.2. Fraudulent Use of Virtual Currency

This type of crime is manifested in the field of virtual currencies by taking advantage of investors' enthusiasm and greed for virtual currencies, and cheating them by means of false propaganda, market manipulation and theft of information. These offences not only bring huge economic losses to investors, but also undermine the credibility and stability of the virtual currency market.

Offences of fraudulent use of virtual currencies can be divided into two categories depending on whether they actually involve the use of virtual currencies. The first category involves the actual use of virtual currencies to commit fraud, including such means as conducting false cryptocurrency transactions or issuing air coins with no real value, through which investors are defrauded of their funds. The second category is fraud in the guise of virtual currencies. In this type of crime, criminals often adopt the marketing model of pyramid schemes, setting up imitation virtual currency platforms or fictitious investment projects, and luring investors to fall prey to fraud by using the bait of high returns from investing in virtual currencies, which do not have any real economic value, and whose price is completely manipulated by the organisers. Once a new investor joins, the MLM organisers will manipulate the market price so that the early investors can make false profits, thus attracting more people to join. This Ponzi-style operation will eventually lead to a break in the capital chain, causing investors to suffer huge losses.

In September 2019, Zhang Ziwei, Zeng Xueqiang and Lei Hui were invited to join an offshore fraud ring in Kuala Lumpur, Malaysia. The gang grouped its members together and used WeChat groups to commit telecoms fraud. They played the roles of speculation experts, assistants and fake investors, and through carefully woven lies deceived the victims into trusting them, inducing them to register on the KOTDAR platform and purchase digital currencies such as USDT or Firecoin for the so-called WSCT digital currency trading. After creating a false appreciation phenomenon, they

refused the victims to withdraw their cash and illegally appropriated the digital currencies they had invested, thus achieving the purpose of fraud [3].

2.3.3. Illegal Theft of Virtual Currency Offences

The potential crimes committed through the illegal acquisition of virtual currencies are not singular, primarily due to the ongoing debate in China over the legal status of virtual currencies. Despite the term "currency" in their name, virtual currencies are currently not recognized as legal tender in China. In judicial practice, there exist two primary schools of thought: the network data perspective and the property perspective.

If virtual currencies are viewed as assets with economic value, then the illegal acquisition of such assets would constitute the crime of theft. In such a scenario, virtual currencies are deemed to have equivalent value to traditional currencies or commodities, and their illegal acquisition would directly lead to property losses for the original owner. Therefore, the law would severely punish such acts from the perspective of protecting individual property rights.

In the Wu Hong'en theft case, the defendant Wu Hong'en utilized technical means to steal over 200,000 yuan worth of Bitcoins from the victim Jin. Subsequently, he utilized malware to illegally obtain the account and password of the victim Liu's "MMM" investment platform, stealing over 60,000 yuan. The defendant appealed, and his defense attorney in the second trial argued that Bitcoins do not constitute the object of theft, suggesting an error in the application of the law. However, the court ruled that as virtual currencies, Bitcoins, while existing in the digital world, possess realizable value representing the property rights of the victim in real life and should be protected by criminal law. Therefore, the court found the defendant's actions to constitute the crime of theft [4].

Another perspective views virtual currencies as data within computer information systems, and the illegal acquisition of virtual currencies would constitute the crime of illegally obtaining data from a computer information system. Virtual currencies exist in the form of data within computer systems, and their security and integrity are crucial to the stable operation of the entire information system. Once these data are illegally obtained or tampered with, it can not only cause losses to the original owner but also pose threats to the security and stability of the entire information system. Therefore, the law also imposes strict regulations on such acts.

The case of Li and Zhang stealing Bitcoins is the first case in China where the crime of illegally obtaining data from a computer information system was applied to a Bitcoin theft. In this case, Li and Zhang illegally hacked into the "QuickCoin" website using hacking techniques, stealing Bitcoins worth up to 7.5 million yuan. Despite the economic value of Bitcoins, the court ultimately did not consider them as traditional property but convicted the two under the crime of illegally obtaining data from a computer information system. This case serves as an important reference for future trials involving the theft of virtual currencies and has sparked widespread discussions on the legal status and protection of virtual currencies [5].

3. Difficulties in Criminal Law Enforcement for Offences Involving Virtual Currencies

Existing legal systems are often constructed on the basis of the traditional physical world, and the emergence of virtual currencies is undoubtedly a challenge to this traditional framework. Existing legal frameworks are lagging behind in responding to cases related to virtual currencies and are unable to fully adapt to the new situation. The governance of virtual currency offences faces an unprecedented dilemma.

3.1. Ambiguity in the Legal Attributes of Virtual Currencies

Decentralised virtual currencies pose a challenge to the existing centralised legal system. In accordance with their own regulatory needs and values, countries have adopted diverse identification and regulatory approaches to virtual currencies, and no uniform standards have been formed internationally for the definition of the legal attributes of virtual currencies and their legal application.

Taking the United States as an example, the IRS, the Securities and Exchange Commission and the Commodity Futures Trading Commission have different determinations of virtual currencies to meet their specific regulatory needs. The IRS treats virtual currencies as “property” for tax purposes; the SEC regulates virtual currencies that have the characteristics of “securities” and includes them in the category of “securities”; and the CFTC considers virtual currencies as “property” for tax purposes. The Securities and Exchange Commission regulates virtual currencies that have the characteristics of “securities” and classifies them as “securities”, while the Commodity Futures Trading Commission classifies virtual currencies as commodities for regulatory purposes. In addition, the Virtual Currency Act of 2020 passed by the U.S. Congress also adopted the strategy of regulating the industry, and did not uniformly define the legal attributes of virtual currencies, but classified them into three categories: virtual currencies, virtual commodities and virtual securities, which are respectively under the responsibility of different regulatory agencies [6]. In judicial practice, the U.S. courts are also divided on the identification of virtual currencies, with some courts treating them as currencies, while others treat them as commodities [7,8].

The financial regulators and courts of a part of the countries, in specific cases, have already given recognition to the legal effect of the transaction behaviour of using virtual currencies as a means of payment. At the same time, in order to promote the payment application of virtual currencies, some countries are actively improving the relevant laws. Taking Russia as an example, in 2018, Russia passed a bill related to digital financial assets, which clarified the conditions for the legal acquisition, holding and transfer of digital assets, including virtual currencies, which provides a solid foundation for virtual currencies to be regarded as civil rights objects in law [9].

In China, the government's attitude towards virtual currencies is more cautious: in 2013, the People's Bank of China (PBOC) and five other ministries defined virtual currencies such as Bitcoin as “virtual commodities” in a Circular. In 2017, the People's Bank of China, in conjunction with seven other ministries, issued the Announcement on Preventing the Risks of Token Issuance and Financing, which provides risk tips to ordinary investors and characterises the issuance of virtual currencies as an act of illegal public financing, and has yet to clarify the legal attributes of virtual currencies themselves.

As mentioned earlier, at present, there are mainly two views on the determination of the legal attributes of virtual currencies: the property view and the electronic data view.

The property theory holds that virtual currencies have significant economic value and exchange capacity, similar to traditional property, and that some legal judgements have treated them as property for protection. In contrast, the electronic data theory stresses that virtual currencies are essentially electronic data generated based on decentralised technology, and that their form of existence and mode of transaction highlight their digital nature, so that they are more likely to be regarded as a kind of electronic data rather than property in the traditional sense.

The legal attributes of virtual currency play a very important role in the judgement of the case. When virtual currencies are deemed to be property with economic value, the offence is usually considered more serious and therefore carries a heavier penalty. On the contrary, if it is only considered as simple electronic data, the same behaviour may only attract a lighter penalty, and the illegal acquisition and use of electronic data is legally far less serious than the theft or fraud of physical property. The ambiguity of the legal attributes of virtual currencies makes the judicial organs

in the conviction and sentencing of the lack of clear standards, and often appear the phenomenon of 'the same case with different judgements', resulting in a large difference in the results of the criminal penalties, which affects the fairness and authority of the law [10].

3.2. Difficulty in Determining "Knowledge" of Offences Involving Virtual Currencies

The determination of knowledge is of paramount importance in law and is directly related to the culpability of the suspect and the determination of the penalty. When a person intentionally commits an act "knowing" that it involves illegal activities, he or she is legally liable to a higher degree of responsibility.

In the area of virtual currency offences in particular, the determination of "knowledge" is more complex and problematic. Virtual currency transactions have a series of special characteristics, such as anonymity, decentralisation and the convenience of cross-border transactions, which make it exceptionally difficult to trace the true nature of the transactions and accurately grasp the actual intentions of the traders. Against this background, the question of how to accurately determine whether the person involved in the case "knew" that his or her actions were illegal has become an urgent issue.

In many cases of criminal offences involving virtual currencies, the establishment of some of the offences has a clear requirement that the subjective knowledge of the perpetrator must be consistent with his or her objective behaviour. For example, in cases such as the offence of assisting network information activities, the offence of money-laundering and the offence of concealing and concealing the proceeds of crime, it is necessary to carry out a strict examination of the "knowledge" of the perpetrator.

In some of the virtual currency crime cases, a large number of people were involved, playing different roles, such as organisation, planning, technology and promotion. There are differences in the degree of understanding of the technology and the project among these personnel, and some of them have even shifted from the role of investors, following the trading rules set by the organisers and planners. With regard to the determination of knowledge, the content of knowledge is of great significance in distinguishing between crimes and non-crimes, and between this crime and that of another, and there are great differences in the subjective knowledge of the persons involved in these virtual currency crime cases, which has caused great trouble to judicial practice [11].

3.3. Difficulties in the Criminal Disposal of Virtual Currency Involved in the Case

The criminal disposal of virtual currencies involved in a case refers to a series of handling processes and measures carried out by law enforcement and judicial authorities in accordance with the law for virtual currencies used as tools of crime, illegal gains or case-related assets in cases involving criminal offences.

Virtual currencies involved in crimes face multiple and complex challenges in the criminal disposal process. It is difficult to seize virtual currencies involved in cases; due to the unique characteristics of virtual currencies, even if the law enforcement authorities are able to seize the relevant storage equipment, criminals or their accomplices may still make use of the previously retained backup of the private key to easily transfer the virtual currency elsewhere, rendering traditional means of seizure ineffective to a certain extent. At the same time, the difficulty of recovering funds should not be underestimated. At present, the regulatory system of the virtual currency market is not yet perfect, and the flow of funds is often difficult to accurately track. Coupled with the limitations of technical means, law enforcement agencies often have difficulty in obtaining accurate transaction information when recovering virtual currencies involved in cases, which undoubtedly increases the difficulty of recovery work.

Another notable problem is how to legally and effectively store the virtual currencies involved in these cases. Traditional asset custody methods are inadequate when dealing with such digitised assets, and existing laws and regulations fail to provide clear guidance in this regard, leaving investigating authorities at a loss in the custody process. In addition, when it comes to the disposal of virtual currencies, the problem is equally difficult. At present, the market lacks a clear and standardised channel for liquidation, and there is no uniform standard for value assessment. This leads to problems in the process of realisation, such as realisation qualifications, fees and supervision.

To further complicate matters, the value of virtual currencies is extremely volatile, and this instability makes it extremely difficult to accurately assess their value. Coupled with the differences in prices between various trading platforms, this further exacerbates the complexity of determining the price of the virtual currency in question. This inconsistency in value standards not only increases the difficulty of judicial practice, but may also lead to disputes over the outcome of related cases.

4. Countermeasures to Improve the Legal Regulation of Offences Involving Virtual Currencies

4.1. Clarify the Legal Attributes of Virtual Currencies

The legal attributes of virtual currencies have always been controversial and ambiguous, which has brought great challenges to judicial practice. Clarifying the legal attributes of virtual currencies is of great significance for combating crimes involving virtual currencies, maintaining financial order and safeguarding citizens' property. Only by clearly defining the legal attributes of virtual currencies can criminal acts be accurately defined, providing clear guidance for judicial practice, thereby effectively curbing all kinds of illegal and criminal activities using virtual currencies and maintaining the stability and healthy development of the financial market.

It is essential to recognise the property value of virtual currencies in the field of criminal law, which, as a digitised expression of value, has demonstrated globally its unique economic value and liquidity, which is reflected not only in its function as a medium of exchange, but also as a means of preserving and increasing the value of assets. From the perspective of economic value, virtual currencies should be endowed with property attributes to better protect the rights and interests of their holders. With the continuous development of the virtual currency market, related legal disputes and controversies are increasing. Without a clear definition of property attributes, the judiciary will face great difficulties and challenges in handling these cases.

The author suggests that virtual currencies be divided into high-value virtual currencies and low-value virtual currencies, and that their legal attributes be recognised differently.

High-value virtual currencies, such as bitcoin and ethereum, have demonstrated their potential as a means of preserving and increasing the value of assets by virtue of their wide market acceptance and strong liquidity. These virtual currencies not only have clear economic value, but have also formed a large trading ecosystem globally. They should be clearly recognised as virtual assets with property attributes. Such recognition is not only in line with the actual value of virtual currencies, but also helps to protect the rights and interests of investors and consumers and promote the healthy development of the virtual currency market.

In contrast to high-value virtual currencies, low-value virtual currencies, such as torrents and air coins, lack real economic value and application scenarios. These virtual currencies are often developed by small teams or individuals and lack strong technical support and market foundation. Due to the lack of widespread market recognition and liquidity, their value fluctuates greatly and may even go to zero at any time. Such virtual currencies should not be recognised as virtual assets with property attributes. They lack actual economic value and application scenarios, and their trading

behaviour often involves greater risk and uncertainty. Therefore, low-value virtual currencies should be regarded as a form of electronic data.

Considering the rapid changes in the virtual currency market, new virtual currency projects are springing up, while some existing currencies may gradually lose their mainstream status due to changes in market demand, technological innovation or the competitive landscape. Such market dynamics require sufficient flexibility and foresight in the classification and determination of legal attributes in order to capture and adapt to these changes in a timely manner, and thus the establishment of a dynamic value assessment system is essential. The dynamic value assessment of virtual currencies should rely on the comprehensive consideration of real-time data collection and updating, technology assessment, market analysis, legal and regulatory environment analysis, economic modelling and financial analysis, and risk assessment. The system is capable of tracking and assessing the market value, liquidity, technical security and other factors of virtual currencies in real time, providing objective and comprehensive data support for classification and identification. This helps to accurately distinguish between high-value and low-value virtual currencies, clarify their legal attributes, provide a scientific basis for judicial practice and regulatory measures, protect investors' rights and interests, and promote the healthy development of the virtual currency market.

4.2. Precise Identification of "Knowledge"

In cases involving virtual currency offences, the determination of "knowledge" is not only an important part of the legal process, but also a complex issue involving multi-dimensional assessment. The determination process integrates knowledge from multiple disciplines, such as law, psychology and data analysis, and aims to accurately determine the perpetrator's state of awareness of the illegality of his or her actions.

From a behavioural psychology perspective, the personal traits of the actor, such as educational background and occupational experience, have a profound effect on their cognitive abilities. These traits constitute a person's cognitive schema, which determines how they understand and interpret their surroundings and information. The cognitive schema of actors with relevant professional knowledge and experience in transactions involving virtual currencies may make it easier for them to identify and interpret illegal signals in transactions.

The reaction of the perpetrator in a legal investigation is also an important consideration. Research in legal psychology and behavioural analysis suggests that, when faced with a legal investigation, perpetrators' reactions may reveal their perception of the illegality of their actions. For example, behaviours such as evading an investigation, destroying evidence or providing false statements may indicate that the perpetrator is attempting to conceal his or her unlawful behaviour.

Modern scientific and technological means, in particular data analysis and big data processing technologies, also provide powerful technical support for the determination of "knowledge". These technologies allow for in-depth mining and analysis of the perpetrator's transactional data and the discovery of its relevance to illegal activities. This not only improves the accuracy of the determination, but also enhances the objectivity of the determination.

4.3. Improvement of Criminal Disposal Procedures for Virtual Currencies Involved in Cases

In the digital age, virtual currencies, as a new type of asset class, have brought new challenges to criminal disposal due to their unique decentralisation and anonymity. Traditional law enforcement means and laws and regulations are overstretched in the face of virtual currency offences, which makes the criminal disposal of virtual currencies an urgent challenge to be solved. The criminal disposal of virtual currencies involved in a case refers to a series of handling processes and measures carried out by law enforcement and judicial authorities in accordance with the law for virtual

currencies used as tools of crime, illegal gains or case-related assets in cases involving criminal offences. The disposal process covers the seizure, attachment, value assessment and final legal disposal of virtual currencies. In order to effectively respond to this challenge, this paper will propose strategies to deal with the seizure and recovery of virtual currencies involved in the case, as well as their safekeeping and realisation.

With regard to the seizure of virtual currencies involved in cases, there is the problem that criminals may use private key backups to transfer virtual currencies, and the first priority of law enforcement agencies should be to immediately take control of the private key backups, and to analyse in-depth and extract the key information contained in the backups through professional and technical means, in order to prevent illegal transfers. While controlling private keys, they should also be strictly encrypted, using advanced encryption technology to ensure the security of private key data, thereby reducing the risk of data leakage.

The current regulatory system for the virtual currency market has not yet been perfected, which makes it difficult to trace the flow of virtual currencies and poses a great challenge to the recovery of virtual currencies involved in cases. Law enforcement agencies should strengthen the overall regulation of the virtual currency market, including strict examination of trading platforms and continuous monitoring of their operations to ensure that they comply with regulatory requirements. In the recovery process, advanced blockchain tracking technology and big data analysis technology can be used to more accurately track the flow of funds of the virtual currencies involved in the case and effectively improve the success rate of seizure and recovery of funds.

There are also many challenges in the custody and realisation of the virtual currencies involved. The digitised nature of virtual currencies makes traditional physical storage methods inapplicable. At the same time, as virtual currencies require a highly secure environment for storage, they involve complex encryption technology, identity verification mechanisms and investment in cold storage equipment, all of which increase the cost of custody. In order to solve this problem, the establishment of a specialised virtual currency depository platform will be key. The platform will not only need to be equipped with multiple security measures, such as advanced encryption technology and 24-hour security monitoring, but will also be able to optimise storage efficiency through automated and intelligent management systems, thereby reducing long-term operating costs.

The handling of virtual currencies involved in cases is equally tricky in the realisation segment. Owing to the volatility of the virtual currency market, determining its fair market value becomes a challenge. To ensure compliant liquidation, depository platforms must establish partnerships with trusted exchanges and financial institutions to provide legally permissible liquidation channels. It was also crucial to develop a uniform and transparent standard for assessing value.

In order to ensure the accuracy and fairness of the assessment of the value of the virtual currency involved in the case, it is necessary to construct a rigorous assessment system. The system should be based on the open market price, and widely collect transaction data and price indexes for analysis to ensure that the assessment results truly reflect the market value [12]. At the same time, it is necessary to reasonably choose the assessment time point to avoid the impact of market fluctuations. Diversified appraisal methods, such as transaction record analysis, financial consulting and value assessment models, are used to deeply explore the intrinsic value of virtual currencies. In addition, professional organisations should be commissioned to carry out the appraisal and be subject to strict supervision and auditing to ensure that the appraisal results are scientific, comprehensive and fair.

5. Conclusion

With the rapid development of the digital economy, virtual currencies have become an important form of asset, impacting traditional financial transactions. However, the frequent occurrence of crimes involving virtual currencies has also brought new challenges. This paper puts forward a series

of targeted countermeasures through an in-depth analysis of the governance dilemma of virtual currency crimes, including clarifying the legal attributes of virtual currencies, establishing a standardised value assessment system, accurately identifying "knowledge" and introducing a "digital identity" authentication mechanism. These measures will help to more effectively combat virtual currencies. These measures will help to more effectively combat crimes involving virtual currencies, safeguard financial order and promote the sound development of the virtual currency market. Looking ahead, we need to continue our efforts to improve the legal status of virtual currencies and the market environment, and through institutional innovation and technological advancement, to continuously enhance the governance of crimes involving virtual currencies, so as to make a positive contribution to the continued prosperity of the digital economy. At the same time, investors are also reminded to enhance their risk awareness, treat virtual currency investments rationally, and work together to maintain a healthy and orderly virtual currency market.

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