
LEGAL ASPECTS OF THE MANAGEMENT OF CRYPTOCURRENCY ASSETS
IN THE NATIONAL SECURITY SYSTEM

Ali Jabbar Saleh¹, Farouq Ahmad Faleh Alazzam², Khaled Khalaf Abed Rabbo Aldrou³, Zhanna Zavalna⁴

^{1*,2,3} *Jadara University, P.O.Box 733, Irbid, 21110, Jordan;*

⁴*V.N. Karazin Kharkiv National University, Freedom Square, 4, Kharkiv, 61000, Ukraine*

E-mail: ^{1}koaduep@gmail.com (Corresponding author)*

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Abstract. Information technology is already widely used in inheritance legal relations. The most typical examples of their application are the preparation of a will with the use of technical means, the fixing of a will certificate with the help of technical means, a notary's appeal to electronic registers in the process of searching for a property, and maintaining the inheritance register. However, it can be stated that the existing technologies are not sufficiently involved in the relations on the compilation, certification, and implementation of the will, which is explained by the tough mandatory regime established for the form of the will. The implementation of the electronic will institution and the expansion of the secret will regime are promising areas of scientific and legislative work in this area. Given the civil law nature of both the rights to individual IT objects and the obligations, which arise from such objects, the issues of inheritance of such objects should remain within the general permissive legal regime. The user should be able to independently decide the fate of their own assets in a virtual environment. Increasing the economic and social value of such assets makes it impossible to find them outside the legal field and therefore should establish a legal regime for their inheritance. It is these factors that affect the national security of countries.

Keywords: security; information technology; digital objects; virtual objects; cryptocurrency assets; digital will

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1. Introduction

Modern technologies daily change human life, enriching it with newer and newer opportunities for self-realization, communication, the dissemination of knowledge, and other human needs. The current degree of development of information technology determines the expansion of the spectrum of social relations arising in a virtual environment. New relations arise around new objects of the virtual space, which have informational, cultural, economic, and personal value for the subjects of these relations.

The clash of interests of individuals in the creation, ownership, use, and disposal of these objects is a factor determining the need to resolve this kind of relations at the level of law. The ability to freely dispose of a virtual object owned by a person, including transferring it by inheritance, should be taken into account in legislation and law enforcement practice. The effectiveness of the legal regulation of these relations is determined by the proper scientific basis, on the basis of which the relevant regulatory legal acts are adopted.

The request of modern society to expand the range of objects of civil law and ensure their proper protection of the rights to these objects necessitates the theoretical development of these issues by the science of civil law.

Achievements of today's industry, expressed in the widespread use of modern information technologies and the emergence of more and more IT-objects that have tangible and intangible value, are slowly reflected in the legislation. Therefore, there is a situation in which law enforcement practice should stay ahead of legislative regulation and this is fraught with unequal or completely incorrect regulation of civil legal relations in practice.

The aim of the work is to develop the science of civil law on the inheritance of IT objects, as well as formulate proposals for improving legislation on the inheritance procedure of these objects.

2. Literature Survey

The problems of the lack of legislative regulation, by the way, concern not only digital money but also process solutions for their use.

Borri, N. (2019), for example, when considering the legal aspects of using "mobile wallets" in payments, drew attention to the problem of distinguishing smartphones with built-in NFC-function and NFC-modules in the form of "payment stickers", which are fixed on a mobile device and are not available in its hardware-software environment in the context of the legislative definition of them as "electronic means of payment."

The uncertainty of regulation of certain universally recognized and widespread cashless payment technologies testifies to the general lag of legislation from the needs of society, which is unacceptable in modern economic conditions (Omane-Adjepong, M., & Alagidede, I. P. (2019); Korauš, A., Gombár, M., Kelemen, P., & Backa, S. (2019)).

The acceptability of any item as money is the first prerequisite for using it to perform this function (Drobyazko, S., et. al. (2019a), Drobyazko, S., et. al. (2019b); Šimonová, J., Čentěš, J., Beleš, A. (2019)).

If most people cannot be assured of accepting this subject, then it will not be able to fulfill its mission (Pittman, A. (2016)).

Electronic money is provided to clients or agents in exchange for cash or non-cash funds (Scott, B. (2016)). The bank is obliged to repay the electronic money issued by it at the request of the client.

Electronic money, more precisely, its monetary value, is stored on electronic media - electronic wallets (Corbet, S., Larkin, C., Lucey, B., Meegan, A., & Yarovaya, L. (2020). An electronic wallet can be compared with a bank current account with its balance sheet and turnover, in the framework of which settlements are carried out (Tsindeliani, I. (2019)).

An electronic wallet is a payment card application that stores electronic money - virtual units of value that are used as a means of payment and are an obligation to repay in cash or non-cash (Zelic, D., & Baros, N. (2018)).

The main difference and advantage of electronic money from payment cards is that a client can open an electronic wallet and replenish it without visiting a bank (Chuen, D. L. K., Guo, L., & Wang, Y. (2017)). This allows transferring funds between e-wallets as soon as possible, as well as paying for goods and services from merchants who work with the system.

Indeed, revolutionary changes in the understanding of "digital money" have taken place with the advent of cryptocurrency - decentralized virtual currencies.

There is very little agreement among scientists about approaches to determining the legal nature of cryptocurrency: they are defined both as money (Hilorme, T., et. al. (2020)), as a means of exchange or calculation (Zamyatin, A., et. al. (2019)) other than money, as monetary substitutes, and as goods (Corbet, S., et. al. (2018)).

In modern conditions, the rejection of the gold standard, the strengthening of globalization and integration of the global economy, the development of information and computer technologies of cryptocurrencies are capable of fulfilling all the functions of money (Nabilou, H. (2019); Limba, T., Stankevičius, A., Andrulevičius A. (2019)).

That is why they can be defined as their new evolutionary form, which was formed as a result of the loss of the intrinsic value of money and the development of cashless payments, by combining financial and technical instruments, as a transition at the informational stage of the development of money from analog to digital form.

Moreover, in the literature regarding the determination of the legal nature of non-cash funds, it was suggested that non-cash money is nothing more than the customer's claim rights to a credit institution, and the balance of funds in accounts is defined as accounting data reflecting the size of these claims.

3. Methods

In the research process, general scientific methods (dialectical, analytical-synthetic, system-analytical) as well as special methods (logical and legal, comparative legal) were used.

The use of the dialectical method allowed analyzing various doctrinal concepts regarding the legal nature of IT objects as objects of property rights; the legal nature of individual IT objects. The analytical-synthetic method was used to determine the scope of the concept of an IT object as an object of inheritance relations. Using a system-analytical research method based on an analysis of the current legislation, factors that excluded the possibility of applying the traditional inheritance procedure in relation to individual IT objects were determined.

Carrying out the factor analysis of forecasting the value of bitcoins using correlation and regression analysis, statistical analysis, and economic and mathematical modeling.

4. Results

Thanks to information technology, there are a number of cash alternatives in the modern world. To date, in the global network, services for the creation and maintenance of electronic accounts are in demand. The development of network payment systems is a consequence of the increase in the share of entrepreneurial activity in the field of electronic commerce. In the process of using payment systems, the material goods (real money) and their liquid digital equivalents on electronic accounts are accumulated.

Over the past decade, the e-commerce market has grown significantly, with a payment instrument such as electronic money, which appeared to increase the volume of electronic purchases. The emergence of electronic money is an important condition for increasing the efficiency and reliability of electronic payments.

The category of "electronic money" implies its simultaneous use in several areas - technical, legal, social, and economic. However, in general, e-money has common signs of money. They act as units of value that are stored on an electronic device, accepted as a means of payment by other persons.

In the context of the globalization of society, a further increase in the use of electronic payment systems is forecasted. Banking, credit, and other financial institutions are trying to introduce new IT-products as quickly as possible, providing the benefits to use them specifically for their customers. The owner of a bank account has many options for paying for goods and services, instant transfer of funds, or cash out. Along with traditional monetary assets, so-called digital money is also developing - WebMoney, QIWI, e-wallets from various Internet services, etc.

Today, individuals and entrepreneurs open online cash accounts (e-wallets) to pay for a wide variety of goods. The market for electronic payment services is occupied by more than one PayPal. Small electronic venture startups and giants like Apple and Samsung compete with its electronic payment systems. Slight differences from traditional means of payment stipulated a quick resolution of issues of legislative regulation of operations with digital money.

The financial and legal nature of cryptocurrency is manifested in its features.

“Decentralization and accessibility - the Bitcoin network is a combination of all client programs (wallets) and a distributed blockchain database (hereinafter referred to as the “blockchain”), which is stored on each computer where the full client is installed. The blockchain is completely open to view the registry of all operations in the system. Connection to this registry is possible using your own wallet or the web interface of special monitoring services from anywhere in the world, without passwords and any other authorization.

Complete transparency of settlements - the history of any payment can be traced until the very moment of coin generation. This kind of information will never be deleted from the database. Knowing only the address of the Bitcoin wallet, you can at any time find out all the transactions that were accepted or sent from it.

Free choice of degree of participation - the user can download the official client Bitcoin Core, which saves the entire transaction history. If the user does not need autonomous work and blockchain analysis, you can install one of the light or mobile wallets that require much fewer resources. For maximum security, there are hardware wallets with additional degrees of protection, the so-called “cold wallets”.

Lack of control over the network - as the blockchain is a distributed base that is created on the basis of equal nodes, the Bitcoin network does not have a control center that can freeze any account, change the number of monetary units in the system, block or cancel the payment. There are small commissions, the amount of which in practice is almost imperceptible and does not depend on the amount of transfer. Agreements in the system are irreversible in the same way as cash transactions.

Absolute indestructible protection - with each new block, the computing power that miners need to calculate the entire chain from scratch grows. The longer the chain, the more difficult it is to “break” the network. To date, the Bitcoin network as a whole exceeds the total computing power of all supercomputers in the world. In order to seize even limited control over it, huge resources and costs of hundreds of millions of dollars are needed (Singh, A., & Chawla, S. (2019)).

Cryptocurrencies are used all over the world. Bitcoin is the most popular cryptocurrency today. However, alternatives to cryptocurrency appear daily.

Now more than 16 million bitcoins have already been issued, the total value of which exceeds \$126 billion. Along with Bitcoin, other currencies can be mined in the cryptocurrency market, the list of which is growing every year. According to 8196 cryptocurrency exchanges, as of the beginning of 2019, the level of cryptocurrency capitalization amounted to \$585 billion. The share of Bitcoin is about 35%, the share of other cryptocurrencies is estimated as: Ethereum - 18.9%, Ripple - 8.8%, Bitcoin Cash - 5%, Cardano - 3%, Litecoin - 1.8% (Table 1).

Table 1. TOP-7 indicators of common cryptocurrencies in 2018

Name (designation)	Author (site)	Year of creation	Exchange rate/ price, dollar	Capitalization, million dollars	Maximum issue, million units
Bitcoin (BTC)	Satoshi Nakamoto (www.bitcoin.org)	2009	11532	194083	21
Ethereum (ETH)	Vitaliy Buteryn (www.ethereum.org)	2015	1105	107 487	90
Ripple (XRP)	Ryan Fugger (www.ripple.com)	2012	1,23	47 721	100000
Bitcoin Cash (BCH)	Amaury Sechet Bitcoincash.org	2017	1657	28070	21
Cardano (ADA)	Charles Hoskins Cardanofoundation.org	2017	0,62	16 205	45 000
Stellar (XLM)	Jed McCaled www.stellar.org	2014	0,62	11 156	100000
Litecoin (LTC)	Charlie Lee (www.litecoin.org)	2011	60,8	9 998	84

Source: A selection of authors according to the online resource Cryptocurrency Market Capitalizations. 2019.

To identify correlations, the authors constructed a matrix of pair correlations based on common cryptocurrencies (Table 1): Bitcoin (BTC), Litecoin (LTC), Ripple (XRP), Ethereum (ETH). The study analysis period was (six months) and included 185 daily observations for the period from 24.07.2018 to 24.01.2019. The stellar cryptocurrency was not included in the regression model because Stellar is a branch of Ripple, so both have an extremely high pair correlation level.

Similarly, we excluded Bitcoin Cash because it is also a branch of Bitcoin with an extremely high pair correlation level. Cardano cryptocurrency was not included in the study base because this currency is new, emerged in late 2018, and significantly shortens the study period.

As a result of the calculations, we obtain a correlation matrix (Table 2).

Table 2. Matrix of paired correlations of cryptocurrencies as factors

	Bitcoin	Litecoin	Ripple	Ethereum
Bitcoin	1.00			
Litecoin	0.92	1.00		
Ripple	0.68	0.76	1.,00	
Ethereum	0.79	0.85	0.87	1.00

Source: Designed by the authors

The data in Table 2 show that, according to the Chaddock scale, multicollinearity acts in all respects. Pair correlations of BTC cryptocurrency with cryptocurrency LTC, XRP, ETH and all other correlation pairs are very strong or strong. Secondly, there are no zero pair correlations with the value of Bitcoin, which would require the exclusion of the factor. In connection with this feature, the most influential and independent factors should be selected from the above list. It can be seen that, on the Chaddock scale, pair correlation greater than 0.7 exists among all factors, therefore it is advisable to include them in the models at the same time.

The largest, almost functional influence on Bitcoin is provided by the cryptocurrencies Litecoin and Ethereum. Therefore, the choice among these two factors should be clarified. For further analysis and correlation search, it is enough, with a high degree of certainty, to choose Litecoin (LTC) as an independent factor in cryptocurrency.

The construction of a matrix of pair correlations gave grounds to minimize the number of factors. For the initial analysis, we selected, according to the Chaddock scale, five significant factors that have the largest, almost functional influence on bitcoin from the above set - Nasdaq Composite, S&P 500, Nikkei 225, FTSE China A50, PTC.

Table 3. Matrix of pair correlations of stock indices and shares of companies as factors

Indicator/Factor	Bitcoin	Nasdaq Composite	S&P 500	Nikkei 225	FTSE China A50	PFTS	PTC	SXXP 600
Bitcoin	1.00							
Nasdaq Composite	0.81	1.00						
S&P 500	0.81	0.99	1.00					
Nikkei	0.68	0.71	0.68	1.00				
FTSE China A50	0.54	0.54	0.54	0.81	1.00			
PFTS	0.07	0.01	0.00	0.47	0.60	1.00		
PTC	0.55	0.80	0.84	0.50	0.46	-0.02	1.00	
SXXP600	0.34	0.49	0.46	0.84	0.79	0.69	0.33	1.00

Source: Designed by the authors

The data in Table 3 reveals that the Ukrainian PFTS index is weakly linked to the price of bitcoins.

We apply the step-by-step exclusion of factors by the selection criterion. Pair correlations are very strong or strong for many factors: for example, for the S & P 500 and NASDAQ Composite, S & P 500 and Nikkei 225, S & P 500 and PTC; Nikkei 225 and NASDAQ Composite, Nikkei 225 and STOXX 600; PTC and NASDAQ Composite. This means that, despite their importance in shaping the impact on bitcoin, they should not be immediately included in the regression model.

By the factor selection criterion, we can replace the following interrelated factors with one or more of the factors that have the greatest impact on Bitcoin - NASDAQ Composite, S & P 500, Nikkei 225. These three factors will be chosen for further analysis.

For the appropriate analysis, we examined the actual data for the last 3 years and analyzed the monthly dynamics of the value of bitcoins and 8 other factors, among which the shares of such companies as (World Financial Market, 2019): SSE PLC (SSE, United Kingdom, GBR) Facebook Inc (FB, USA, USD); Netflix Inc (NFLX, USA, USD); Twitter Inc (TWTR, USA, USD); Apple Inc (AAPL, USA, USD); Intel Corporation (INTC, United States, USD); Alibaba Group Holdings Ltd (BABA, USA, USD); Honda Motor Co Ltd (7267, Japan, JPY).

Table 4. Matrix of pair correlations of stock indices and shares of companies as factors

Indicator/Factor	Bitcoin	SSE PLC	Facebook	Netflix	Twitter	APPLE	Intel Corporation	Alibaba Group	Honda Motor
Bitcoin	1.00								
SSE PLC	-0.67	1.00							
Facebook	0.73	-0.69	1.00						
Netflix	0.75	-0.7	0.91	1.00					
Twitter	-0.18	0.38	-0.66	-0.53	1.00				
APPLE	0.76	-0.52	0.69	0.8	-0.005	1.00			
Intel Corporation	0.82	-0.45	0.74	0.72	-0.25	0.72	1.00		
Alibaba Group	0.82	-0.6	0.88	0.87	-0.28	0.89	0.81	1.00	
Honda Motor	0.07	0.14	-0.42	-0.11	0.72	0.21	0.02	-0.1	1.00

Source: Designed by the authors

The further application of step-by-step exclusion of factors by the selection criterion will help determine the most influential and independent factors. In our case, there will be two factors of Intel Corporation and SSE PLC.

In the final part of the work, to demonstrate the effectiveness of the approach, the results of testing the correlation-regression model with the help of forecasting the value of bitcoins are presented. It is understood that this kind of forecasting cannot cover large time intervals and is based on data from the base period.

The base period for the analysis was January 2016 - December 2018. The forecast period is the working days of the month following the base period (January 2019). The calculation results are shown in Table 5.

Table 4. Validation of the model on actual data factors

Date 2019	X ₁	X ₂	X ₃	X ₄	X ₅	Bitcoin - actual value	Bitcoin - estimated value, Y	Approximation error, %
25.01	180.3	1.2397	23669.49	1262.5	45.3	11259.4	12548.71	11.45
24.01	180	1.2408	23940.78	1279.5	45.51	11359.4	12558.51	10.56
23.01	177.8	1.2299	24124.15	1295	46.06	10868.4	12462.34	14.67
22.01	180	1.2262	23816.33	1296.5	45.75	10931.4	12419.14	13.61
19.01	193	1.2222	23808.06	1291	44.82	11607.4	12747.99	9.83
18.01	192.8	1.2239	23763.37	1300	44.48	11474.9	12649.11	10.23
17.01	186.5	1.2186	23868.34	1342	44.39	11188.6	12202.23	9.06
16.01	188.3	1.226	23951.81	1333	43.14	11490.5	12129.72	5.56
12.01	236.9	1.2187	23653.82	1321	43.24	13980.6	14048.03	0.48
11.01	229.4	1.2032	23710.43	1318	43.41	13405.8	13681.41	2.06
10.01	250.5	1.1947	23788.2	1305	42.5	14973.3	14342.24	4.21
9.01	247	1.1937	23849.99	1310	43.62	14595.4	14401.75	1.33

Notes: Y - The cost of bitcoin, in US dollars; X₁ - Litecoin cryptocurrency (LTC) (value 1 LTC in USD); X₂ - Currency pair EUR/USD (value 1 EUR in USD); X₃ - Nikkei Index 225, in Japanese Yen (JPY); X₄ - Shares of SSE PLC, in pounds sterling (GBR); X₅ - Shares of Intel Corporation, in US dollars.

Source: Designed by the authors

As can be seen from Table 5, the average relative error of approximation is 7.75% (and the normative value should not exceed 10-12%). This means that the constructed model of multiple regression adequately describes the relationship between the value of bitcoins and selected factors at short-term time intervals. An increase in the forecast period (forecast for February 2019) leads to a distortion of the calculated values of Bitcoin and requires adjustment of the model, that is, the inclusion of the actual values of Bitcoin and selected factors for January 2019 to the base period.

The multifactor analysis made it possible to select five factors among 33 studied global financial indicators that have a significant impact on the value of bitcoins. These factors are the Litecoin cryptocurrency (LTC); currency pair EUR/USD; Japanese stock index Nikkei 225; shares of SSE PLC and Intel Corporation.

Correlation-regression analysis indicates a directly proportional relationship with the Bitcoin value of such factors Litecoin, EUR/USD, Nikkei 225, Intel Corporation; SSE PLC has an inversely proportional relationship. It was revealed that among the above factors, SSE PLC shares have a negative INFLUENCE: an increase in their value leads to a decrease in the value of bitcoins.

The constructed correlation-regression model and the obtained functional dependence allows predicting the value of bitcoins with an average relative error of 7.5%.

It should also be noted that, in addition to the factors identified, a significant influence on the value of bitcoins can be achieved not only by supply and demand but also directly by the scalability of the bitcoin network. The intervention of state regulatory institutions, the shadow money market, and the volume and nature of news on the cryptocurrency market. It is from these positions that it is advisable to conduct further research.

To highlight the features of the inheritance of cryptocurrency assets, it is important to first turn to an analysis of existing approaches to determining the legal nature of cryptocurrency. It should be noted that in the civilist doctrine there is no unity of opinion regarding the legal nature of cryptocurrency and its place in the system of objects of civil rights.

However, bitcoins are neither a personal intellectual creation (are the result of the action of a software process), nor software (only the Bitcoin management protocol is software). The acquisition of ownership of the newly created thing (the creator of the cryptocurrency unit formally has the right to use, own, and dispose), as well as the nature of transactions made with cryptocurrency (purchase and sale, exchange), make it possible to consider them objects of thing rights.

However, the anonymity of transactions makes it difficult to fully implement civil law. In particular, the problem of restoring violated rights and imposing interim measures by a court arises. From the point of view of civil law science, it is also interesting to discuss the nature of transactions whose objects are cryptocurrency assets. So, the researchers note that, on the one hand, if someone buys a product in exchange for money, it is classified as a sales contract. It seems obvious that if you pay for a purchase using Bitcoin, then this is a typical example of a sales contract.

But if we examine in more detail the legal norm that defines the sales contract under German law (§ 433 of the German Civil Code (Bürgerliches Gesetzbuch)), then we can draw another conclusion. A sales contract is a contract that includes an obligation to transfer ownership of movable property in exchange for a cash payment. Since bitcoins cannot be classified as money, a contract with bitcoins cannot be regulated as a contract of sale (Alvarez, M. (2018)).

Thus, cryptocurrency has all the features of the currency except for the presence of the issuer. If we proceed from the modern definition of the concept of “currency”, according to which the currency is the external form of goods and services, which acts as a common equivalent and medium of exchange, is characterized by a high degree of liquidity, is divisible and portable, and has no intrinsic value, then cryptocurrency should be classified as a type of currency.

So, the property of the cryptocurrency is depersonalized, the owner is not fixed anywhere and is not defined in any registries, and the proof of ownership cannot be obtained in any form. That is, the ability to own, use, and manage a cryptocurrency depends only on the availability of the number of a special electronic cryptocurrency wallet and a password for access to it (public and private keys). Each person stores the wallet number and access key at his (her) discretion (in memory, on paper or on electronic media), so no one has access to this wallet if he (she) does not have a password, even with the consent of his (her) owner or by a court decision.

So, the inheritance of cryptocurrency assets according to the law seems technically impossible process due to the characteristics of the object itself. As for the will, in accordance with civil law, a person can leave a secret will, the regime of which, of course, allows including the inherited cryptocurrency asset.

Nevertheless, today, in practice, there are several ways to inherit cryptocurrency funds.

The researcher conditionally divided all methods of inheriting cryptocurrency assets into two groups (Dniprov, O., et. al. (2019)):

“estate planning” methods, that is, those associated with the planning by the owner of the fate of his (her) property after his death;

- methods, which are applied when the testator in no way showed his (her) will.
- An analysis of recent publications allows classifying all the proposed methods as follows:
- traditional (using mechanisms enshrined in current law)
- technological;
- mixed.

Among the traditional methods of cryptocurrency inheritance, they usually offer the use of a classic will with the details of the cryptocurrency wallet and the access key to it. In this way, however, the anonymity of ownership of such a wallet is leveled and there is a risk of loss of funds through the awareness of others.

To ensure the inviolability of funds, it is proposed to indicate only the public key in the text of the will, and keep the private key separately. The disadvantages of this method are obvious - due to various circumstances there is a danger of a permanent loss of access keys to the wallet.

Among the technological methods of transferring cryptocurrency assets to heirs, the following are distinguished: deferred payment systems built into the crypto-wallet client programs themselves; the use of specially created Internet resources for the inheritance of digital assets; deferred wallet access systems.

One of the most modern ways to save a key and the ability to transfer it to heirs is an encrypted electronic data storage based on blockchain technology. The owner of the wallet transfers the data (wallet number and key to it) to the storage, where they are encrypted. The owner also leaves an order on the procedure for transferring data to third parties (for example, after submitting a death certificate). This technology is reliable for storing and protecting information from third parties, but, like any technology, it cannot guarantee the safety of data completely.

Mixed methods include the inheritance of crypto wallets in paper and hardware forms. Access keys can be quite traditional things, and an indication of their location can be contained in the text of the will.

The easiest and most affordable way is to use a bank cell to store the cryptocurrency wallet key. In this case, the owner of the cryptocurrency wallet during his (her) life is the only person, who retains access to such a wallet, and, at the same time, he (she) can indicate in the will the presence of a bank cell without specifying what is stored there.

It is worth noting that, in most cases, as judicial practice shows, claims are sent to banking institutions. However, there are also cases in which the notaries who refuse to perform a notarial act to issue a certificate of inheritance, are unable to verify the composition of the property.

Returning to the methods of inheritance of cryptocurrency assets, it should be noted that all the above methods are such that clearly reflect the testator's will. However, it is far from always that a person decides in advance the fate of his (her) property. In cases of impossibility to identify the real testator's will, the absence of special rules on the inheritance of digital financial assets is most acute.

An attempt to resolve this issue can be found in German law and practice. If the testator does not have a cryptocurrency asset in his (her) will, then this person has never had this kind of property. That is why European lawyers recommend indicating the income from the use of cryptocurrency in tax returns, which will further help heirs and their lawyers find out about the availability of assets and begin the process of obtaining rights to it.

Given today's technology, in the case of the absence of the will (in legally established or electronic form), a cryptocurrency asset can only be inherited if it is stored on an online or mobile wallet and served by the respective cryptocurrency exchange operators. In this case, there are third parties with access to the wallet and to whom the relevant requirements can be presented. The inheritance of tokens also has its own characteristics (Klochko, A.N., Kulish, A.N., Reznik, O.N. (2016)).

In the traditional sense, for an inheritance, confirmation of the right of the testator is necessary. It consists in the presence of certain documents or entries in the registry. Separate documents confirming the rights may be issued by third parties: state or authorized bodies of the state, other competent persons. For example, in many countries the ownership of real estate rights is confirmed by the presence of entries in special state or notary registers, the ownership of shares is confirmed by an extract from the register of shareholders.

The belonging of various financial instruments (bonds, futures, various types of derivatives), among which cryptocurrency tokens are located today, to investment funds can be confirmed by authorized organizations. The possibility of providing such a confirmation of ownership of property and property rights to the testator is an important condition for their further inheritance. Only after such a confirmation, the inheritance can be registered in the property by the heir - he (she) can own, use, and dispose of it at his (her) discretion.

One of the advantages of cryptocurrency as a means of investing is some investor anonymity. Such an anonymity is quite conditional, as state regulators are actively mastering the technique of tracking investors. There is already a debate about the possibility of equating tokens received during the ICO with the company's securities purchased on the exchange. Unlike cryptocurrency assets, in the case of tokens, there is an entity from which funds can be collected in favor of the heirs, but so far such a procedure is not regulated by law, and the courts usually refuse to protect digital assets.

5. Discussion

According to the rules of the Webmoney Transfer company, in order for the heir to be able to obtain the property belonging to him (her) on the certificate of inheritance, it is necessary to take the following steps:

To become a registered member of the WebMoney System.

To issue a personal certificate.

To submit a claim to the arbitration service "Appeal of the rights to own a WM-identifier" and, according to the algorithms proposed by the System, act as a Plaintiff, and indicate as a Defendant a WMID belonging to the testator. As a result of consideration of the claim by the Arbitration of the System, a decision may be made to transfer to the heir the control from the deceased user's WM-identifier for the transfer of funds in accordance with the claim.

If several heirs apply for the inheritance, then each of them will act independently and state their claims for property belonging to him (her). Each of the applicants will be given control from the WM identifier with a limit on the withdrawal of funds in the amount determined in the inheritance certificate.

The experience of legislators and national financial regulators of developed countries shows that cryptocurrency cannot be attributed to any existing type of asset. Mechanical transfer of existing legal regimes to cryptocurrency does not make sense. More and more expert bodies of foreign countries are adopting an approach according to which cryptocurrency should be considered as a unique alternative class of assets, different from all others, with its advantages, risks, and its own legal base.

Given that individual cryptocurrencies differ significantly in characteristics (for example, the functional difference between decentralized and centralized cryptocurrencies), it is most likely that cryptocurrencies themselves need to be categorized and considered when developing legislation. In fact, the prospects for the involvement of cryptocurrency in inherited legal relations as objects depend on the definition of cryptocurrency in the financial system.

The situation with cryptocurrency assets, unfortunately, does not stand apart in the matter of inheritance, because the heirs of users of other payment systems experience difficulties in gaining access to the assets of the deceased persons.

Conclusions

Thus, inheritance transfers of assets represented by electronic money of various systems have their own characteristics in accordance with the policies of companies that issue electronic money and service electronic

wallets. The status of the account held by the testator is also important - whether it was anonymous and not attached to a specific person.

Given the absolute legislative uncertainty of the nature of legal relations on such an object as a cryptocurrency asset, the following doctrinal approaches to the nature of cryptocurrency and the legal status of their owners can be distinguished:

- cryptocurrency is property, which acts as a product in the relationship of sale and exchange, and the owner of the cryptocurrency wallet has a status similar to the owner of the property that is traditional for civil law;
- cryptocurrency is a means of payment in the relations of sale, provision of services, etc;
- cryptocurrency is a special form of exercising the right of claim of their “holder” to receive material equivalent;
- cryptocurrency cannot be attributed to any kind of existing objects of civil law and requires legal regulation as a new object of the law.

When deciding on the inclusion of cryptocurrency assets in the inheritance structure, in practice, it is necessary to consider the functional features of cryptocurrency in general and the specifics of a particular type of cryptocurrency.

Expanding the scope of the use of the secret will, the widespread involvement of technological solutions for the effective protection of the contents of the will, the use of the capabilities of the “electronic” will in the future will simplify the implementation of the right of the owner of the cryptocurrency asset to safely transfer his (her) inheritance rights.

An electronic will is a one-way transaction in relation to the disposal of rights to virtual property in the event of the death of the copyright holder.

Electronic wills should be distinguished from wills in electronic form, the completion of which is provided for in some foreign states. The use of the electronic form of the will is a progressive achievement of the information society. Modern possibilities of using information technologies, however, do not find timely reflection in the legislation, and, therefore, the legal practice also loses from this fact.

Most of the advantages of cryptocurrency for their owner are barriers to the possibility of their inheritance in accordance with the procedures provided by applicable law.

The methods of inheriting cryptocurrency assets can be classified into traditional (using the mechanisms enshrined in the current legislation), technological, and mixed. Traditional methods of cryptocurrency inheritance include methods using a classic or secret will. Among the technological methods of transferring cryptocurrency assets to heirs, the following are distinguished: deferred payment systems built into the crypto-wallet client programs themselves; use of specially created Internet resources for the inheritance of digital assets; deferred wallet access systems. Mixed methods include the inheritance of crypto wallets in paper and hardware forms.

In contrast to cryptocurrency assets, in the case of tokens, there is an entity from which funds can be collected in favor of the heirs, but so far this procedure has not been legally regulated, and courts usually refuse to resolve disputes on such an object as tokens. An analysis of judicial and notarial practice indicates a significant conservatism of judges and notaries in case of need to solve cases involving objects such as cryptocurrency assets.

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Short biographical note about the contributors at the end of the article:

Ali Jabbar SALEH, Professor, Dean of the faculty of Law, Jadara University, Irbid, Jordan
ORCID ID: orcid.org/0000-0003-1975-1173

Farouq Ahmad Faleh ALAZZAM, Assistant Professor of the Faculty of Law, Jadara University, Irbid, Jordan
ORCID ID: orcid.org/0000-0002-7817-9704

Khaled Khalaf Abed Rabbo ALDROU, Assistant Professor of the Faculty of Law, Jadara University, Irbid, Jordan
ORCID ID: orcid.org/0000-0001-7559-4403

Zhanna ZAVALNA, Doctor of Science of Law, Professor, V.N. Karazin Kharkiv National University, Ukraine
ORCID ID: orcid.org/0000-0001-6511-2482

Register for an ORCID ID:
<https://orcid.org/register>