



Factor-Criterion Model of Cryptoassets Viability Assessment

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Abstract: The aim of the study – to identify the system of factors and criteria as well as indices of cryptoassets, to develop a model of cryptoassets viability assessment on their basis. A qualimetric approach for developing a factor-criterion model was used in the study. The system of 7 factors and 30 criteria, as well as 60 indices, which laid the foundation for the developed model, was characterised. 57 specialists-experts were questioned to determine the significance of the factors and criteria in the developed model. The factor-criterion model gives the possibility to compare all the system components of the criteria, even if they are measured in different units, and to determine the general level of cryptoassets viability based on integral assessment. This model is a unique instrument of measuring the level of each component of the cryptoasset as well as its whole integrated unity. It is necessary to study not only the indices of separate criteria to assess and understand cryptoasset viability, but also their interrelations and interaction. Coordination of a complex of purposefully chosen criteria will lead to the real result – improvement of the level of cryptoasset viability. This model can be recommended for emitters, investors and cryptoassets users.

Keywords: Cryptoasset, Viability, Model, Factors, Criteria, Indices

1. INTRODUCTION

The lack of a theoretically grounded system of factors which influence the cryptoassets market, does not allow identifying and systematising the cryptoassets criteria which are an important mechanism of efficient management of this market.

Cryptoassets as a modern financial instrument requires specifying the system of factors, criteria, and their indices, as well as methods of its system assessment.

For a ten-year period of the cryptoassets market history, which is based on the blockchain technology, researchers were studying different aspects of this problem.

The genesis of IT-economy in the information society [1] and the principles of digitalisation of the state economy [2] were studied.

The essence of the notion and the spheres of digital products application were described in [3].

The specific features of the spheres of application and functional possibilities of the blockchain technology were studied in various areas: economy and finance [4; 5; 6],

management [7], education [8; 9], medicine [10; 11], building [12] etc. The term "cryptocurrency" is more widespread in the practical sphere.

Functional possibilities of cryptocurrencies usage were studied in [13; 14; 15].

A legal base of cryptoassets usage is being formed, in particular, the EU legislation does not ban owning cryptoassets or investing into them [16].

The notions of "cryptocurrency" and "cryptoasset" are grounded in theoretical-methodological research and some official documents [17; 18]. It allows analysing essential and inessential features to the full extent, for identifying factors, criteria, and indices of cryptoassets.

The work [19], which deals with methodology of the system approach to classification of the cryptocurrency criteria system, is especially valuable for developing the model of cryptoassets viability assessment.

This research fits the literature about influence of new technologies, block-chain, in particular, on the society and e-commerce. For example, the fundamental effect of the blockchain technology on the society and economy, and the possibilities to manage a cryptocurrency, are studied in [20].

The authors [21] emphasised the importance of bitcoins for e-commerce and confirmed that the bitcoin can play a significant role. The scientists [22] stated that the bitcoin (blockchain) technology can create a new system of values which will maintain the dynamics of the social exchange in a better way. Some academics [23] argued that the blockchain technologies are useful from the viewpoint of transparency, humanisation of the global economic interaction, emotional resonance, and maximisation of economic profit.

Despite the relevance of this problem, the factors, criteria, and indices of cryptoassets are studied and systematised insufficiently, which would allow realising the system assessment of cryptoassets viability.

The aim of the study: to identify the system of factors and criteria, as well as indices of cryptoassets, to develop a factor-criterion model of cryptoassets viability assessment on their basis.

2. MATERIALS AND METHODS

The research methodology is grounded on the system approach to identifying the basic factors, criteria, and indices of cryptoassets. A complex of theoretical

methods is used for this purpose: synthesis, induction, deduction, comparison, generalisation, systematisation.

A factor-criterion analysis is used in the research for developing the model of cryptoassets viability assessment.

57 specialists-experts were questioned to determine the significance of the factors and criteria in the developed model of factor-criterion assessment of cryptoassets viability. The qualimetric apparatus is used in this model for processing the data.

3. RESULTS

The system approach by means of the factor-criterion analysis allowed to identify the basic factors of influence onto the cryptocurrency [19]. According to these factors, let us determine the analogous system of factors which characterise the cryptoassets viability: economic, legal, network, informational, social, technological, technical.

These factors are interrelated, and they influence each other, and thus form a system. Each of these factors is presented by a complex of criteria, which in their turn form a system of criteria. Each of the criteria is characterised by the indices (Fig. 1).

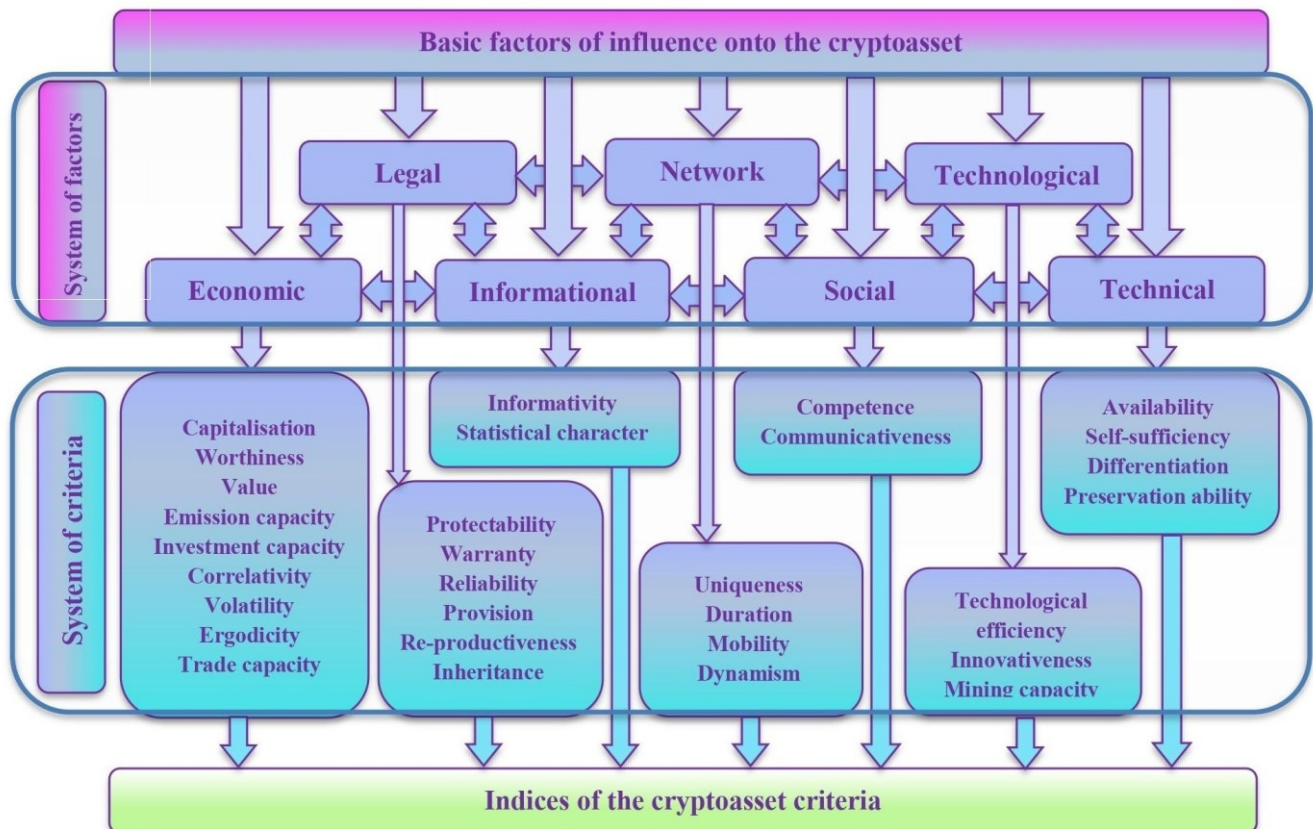


Figure 1. Interconnection of a system of factors and criteria that characterise the cryptoassets viability.



Let us consider them in more detail.

The economic factor is presented by the following criteria:

1. Capitalisation – indicates a part of market capitalisation of the assessable cryptoasset in the general market capitalisation, as well as capacity of cryptoassets which come in and out of the assessable cryptoasset.

2. Worthiness – denotes the exchange value of the cryptoasset and expenditures for its receipt.

3. Value – indicates the fact of value and importance for owners of the cryptoasset.

4. Emission capacity – shows the possibility of generating money before cryptoasset emission or gradual emission of the cryptoasset.

5. Investment capacity – indicates activeness/passiveness among investors.

6. Correlativity – denotes correlation and interrelation of cryptoassets with the market of leading currencies and market capitalisation of the cryptoasset.

7. Volatility – indicates inconstancy of the market cost of the cryptoasset during a certain period and presence/absence of the mature and widespread market of derivatives.

8. Ergodicity – proves the possibility to identify the change in value of the cryptoasset by studying one or all its elements in different periods of the research.

9. Trade capacity – indicates the commercial functions of the cryptoasset (buy-sell, exchange for goods, services, values, money).

The legal factor is presented by the following criteria:

10. Protectability – highlights the legal protection capacity by establishing and acknowledging the right of ownership for the cryptoasset.

11. Warranty – is indicative of the guaranties for the cryptoasset, which regulate documentarily the rules and conditions of its usage after emission.

12. Reliability – denotes the level of reliable capacity and security in managing the system of access and usage of the cryptoasset.

13. Provision – indicates the legal ability to provide the cryptoasset with estate and/or a complex of rights.

14. Re-productiveness – shows the possibility of legal protection of the cryptoasset against theft, mistake/vulnerability of a smart-contract and similar events, as well as policies concerning restoration of the right for the cryptoasset.

15. Inheritance – points at the capacity of inheritable legal relations fixed in the cryptoasset.

The network factor is presented by the following criteria:

16. Uniqueness – indicates the unicity of the cryptoasset.

17. Duration – is determined by the period, during which the cryptoasset exists officially.

18. Mobility – indicates the possibility of operative official transition from one owner to another.

19. Dynamism – displays the changes of the cryptoasset properties in time, demonstrating positive or negative dynamics.

The information factor is presented by the following criteria:

20. Informativity – indicates the availability and authenticity of information about the cryptoasset in mass-media.

21. Statistical character – denotes the possibility to collect, measure and monitor the cryptoasset.

The social factor is presented by the following criteria:

22. Competence – displays authoritativeness of emittents and experience of regulating bodies, entitlement with their own rights and/or coins of the cryptoasset.

23. Communicativeness – demonstrates the aggregate of essential characteristics of the cryptoasset, which favour successful receiving, understanding, mastering, using, and passing the information.

The technological factor is presented by the following criteria:

24. Technological efficiency – indicates the possibility to use the block-chain technology or its analogue.

25. Innovativeness – denotes the activity aiming at solving technical problems, renovation, and improvement of the cryptoasset technological process, stipulates the launch of new competitive goods and services onto the market.

26. Mining capacity – shows the possibility to use one technology of mining or a combination of different technologies for creating the cryptoasset.

The technical factor is presented by the following criteria:

27. Availability – presents the extent to which it is possible to reveal the cryptoasset at trade floors and availability of the appropriate powers concerning its usage.

28. Self-sufficiency – indicates that there are no middlemen of the transaction and no dependence of the cryptoasset from the central management organs.

29. Differentiation – testifies to the possibility of splitting up the cryptoasset into separate parts and combining its complementary parts into the integral object.



30. Preservation ability – is evidence of the cryptoasset characteristic feature to be preserved within the given limits of the parameters meaning.

The indices are outlined for the described system of the cryptoassets criteria. The quantity of criteria is not complete, but it is sufficient and optimal for receipt of the authentic indices of cryptoassets. It should be noted that each of the proposed by us criterion has two indices that enables convenient mathematical working up of the results. That is why the proposed system of the criteria is long-term for further development of the methodical provision with diagnostics of cryptoassets assessment.

To develop the current factor-criterion model of cryptoassets viability it is insufficient only to ground theoretically its components. The demand aroused to determine the significance of factors and criteria. To do this, we developed a questionnaire and held an online survey of 57 specialists in the field of cryptoassets, who acted as experts. The specialists-experts determined the significance in the proposed list of the factors and criteria system.

We illustrate the developed factor-criterion model of cryptoassets viability assessment in the form of Table I.

TABLE I. FACTOR-CRITERION MODEL OF CRYPTOASSETS VIABILITY ASSESSMENT

Factors	α	Criteria	β	Indices	AO	V*
EF	0.17	Capitalisation	0.129	The relative share of the market capitalisation of the assessable cryptoasset in the general market capitalisation	High/Low	0-1
				Correlation of capacities of assets, which come into the assessable cryptoasset and come out of it	More than 1/ Less than 1	0-1
		Worthiness	0.129	Exchange value of the cryptoasset	Availability/ Absence	0/1
				Expenditure for cryptoasset receipt	High/Low	0-1
		Value	0.124	Value of the cryptoasset	High/Low	0-1
				Value of the information on the cryptoasset for the specific time	High/Low	0-1
		Emission capacity	0.118	Possibility to generate coins before the cryptoasset issue	Availability/ Absence	0/1
				Possibility of gradual issue of the cryptoasset	Availability/ Absence	0/1
		Investment capacity	0.112	Activity among investors (buy/sell transactions)	Yes/No	0-1
				Passivity among investors (saving as a deposit)	Yes/No	0-1
		Correlativity	0.106	The correlation level of the cryptoasset with the dollar/euro	High/Low	0-1
				The correlation level of the price for the cryptoasset (token/coin) with its market capitalisation	High/Low	0-1
		Volatility	0.100	The extent of the worthiness volatility within the period given for the analysis	High/Low	0-1
				Availability of the mature and a wide-spread derivatives market	Yes/No	0/1
		Ergodicity	0.094	Possibility to determine the change of the cryptoasset value by the long-term research of one of its elements	Availability/ Absence	0/1
				Possibility to determine the change of the cryptoasset value for a short period of time, based on all its elements	Availability/ Absence	0/1
Trade capacity	0.088	Buy-sell capacity of the cryptoasset	Availability/ Absence	0/1		
		Ability to exchange the cryptoasset	Availability/ Absence	0/1		
LF	0.17	Protectability	0.194	Legal security by determining the right of the cryptoasset ownership	Yes/No	0/1
				Legal security for acknowledging the right of ownership for the cryptoasset	Yes/No	0/1
		Warranty	0.182	Documents which regulate the rules of usage of the cryptoasset after its issue	Availability/ Absence	0/1
				Documents which regulate the conditions of usage of the cryptoasset after its issue	Availability/ Absence	0/1
		Reliability	0.171	The level of reliability in managing the system of access to the cryptoasset	High/Low	0-1
				The level of security in managing the system of usage of the cryptoasset	High/ Low	0-1
		Provision	0.165	Legal provision of the cryptoasset with ownership	Availability/ Absence	0/1
				Legal provision of the cryptoasset with a complex of rights	Availability/ Absence	0/1



Factors	α	Criteria	β	Indices	AO	V*
LF	0.17	Re-productiveness	0.147	Possibility to protect the cryptoasset legally against theft, mistake/vulnerability of the smart-contract and similar events	Availability/Absence	0/1
				Possibility of the necessary events to restore the right for the cryptoasset	Availability/Absence	0/1
		Inheritance	0.141	Possibility to make a will for the cryptoasset	Availability/Absence	0/1
				Possibility to inherit the ownership rights for the cryptoasset	Availability/Absence	0/1
NF	0.16	Uniqueness	0.281	Availability of the unique protocol	Availability/Absence	0/1
				Determined rules and conditions of usage in the information system	Availability/Absence	0/1
		Duration	0.256	Duration of the cryptoasset after its issue	Over 5 years/Up to 5 years	0-1
				Availability to change the expiration date of the cryptoasset after its issue	Availability/Absence	0/1
		Mobility	0.244	Possibility of the fast change of the protocol owners	Availability/Absence	0/1
				Possibility of the official transition of the protocol	Availability/Absence	0/1
		Dynamism	0.219	Tendency to change the trade capacity	Positive/Negative	0-1
				Quantity of transactions	Increase/Decrease	0-1
IF	0.11	Informativity	0.500	Information scope about the cryptoasset in mass-media	Sufficient/Insufficient	0-1
				Authenticity of information about the cryptoasset in mass-media	High/Low	0-1
		Statistical character	0.500	Possibility to collect and analyse quantitative statistical data in the numerical form	Availability/Absence	0/1
				Possibility to collect and analyse qualitative statistical data	Availability/Absence	0/1
SF	0.14	Competence	0.521	Emitents' image and regulators' experience	Availability/Absence	0-1
				Emitents' and regulators' personal rights and/or cryptoasset coins	Availability/Absence	0/1
		Communicativeness	0.479	Social publicity	High/Low	0-1
				PR-campaign	Availability/Absence	0/1
TeF	0.13	Technological efficiency	0.354	Possibility to use the blockchain technology	Availability/Absence	0/1
				Possibility to use the blockchain analogue	Availability/Absence	0/1
		Innovativeness	0.331	The level of renovation/improvement of the blockchain technology	High/Low	0-1
				The level of renovation/improvement of the blockchain technology analogous to the blockchain	High/Low	0-1
		Mining capacity	0.315	Possibility to use only the mining technology	Availability/Absence	0/1
				Possibility to use a combination of mining technologies	Availability/Absence	0/1
TF	0.12	Availability	0.267	Availability of the cryptoasset on the electronic trading floors	Yes/No	0/1
				No limitations to acquire, hold, use, and sell the cryptoasset	Yes/No	0/1
		Self-sufficiency	0.267	Possibility to realise online transactions between users without an intermediary	Availability/Absence	0/1
				Interconnection (dependence) from state and financial institutions	Independence/Dependence	0/1
		Differentiation	0.242	Segmentations of the integral cryptoasset into parts	Yes/No	0/1
				Recombination of complementary parts of the cryptoasset into one unity without the loss of the ownership right for its value	Yes/No	0/1
		Preservation ability	0.225	Ability of the cryptoasset to be stored in the information system	Yes/No	0/1
				Ability of the cryptoasset to realise the necessary functions during transportation	Yes/No	0/1

Note. This is not an exhaustive list. Other factors, criteria, and indices may be taken into account as well. α – the significance of the factor in a system of factors ($\sum_{i=1}^n \alpha_i = 1$), rel. units; β – the significance of the criterion in the relevant factor ($\sum_{i=1}^n \beta_i = 1$), rel. units; AO – answer options; V – indicator value, points; EF – economic factor; LF – legal factor; NF – network factor; IF – information factor; SF – social factor; TeF – technological factor; TF – technical factor.
*In the absence of information (reliable) on the value of an indicator, it is assigned 0 points.



The application of the factor-criterion model enables comparing all the components of the criteria system, even if they are measured in different units, and determine the general level (based on the integral assessment) of the cryptoasset viability.

It is necessary to consider the construction and content of the developed by us model of the factor-criterion assessment of the cryptoassets viability with reference to the principles of qualimetry and practical application in the specific sphere.

The levels of the cryptoasset viability are characterised in the Table II that based on the normal distribution of the index by the interval scale. The distribution interval of the assessment from 0.00 to 0.20 indicates D-level of the cryptoasset viability, from 0.21 to 0.50 – C-level, from 0.51 to 0.79 – B-level, from 0.80 to 1.00 – A-level.

TABLE II. ASSESSING THE LEVEL OF THE CRYPTOASSET VIABILITY

Level of the viability	Integral assessment, points	Characteristics of the viability level
D	0.00 – 0.20	Indicates significant quantity of external and internal problems of the cryptoasset functioning, indicated by the indices of the criteria system of the developed model, and thus they are characterised as unreliable with a high level of risk for viability
C	0.21 – 0.50	Denotes insignificant quantity of external and internal problems of the cryptoasset functioning, indicated by the indices of the criteria system of the developed model, and thus they are characterised as little reliable with an insignificant level of risk for viability
B	0.51 – 0.79	Shows nearly complete absence of external and internal problems of the cryptoasset functioning, indicated by the indices of the criteria system of the developed model, and thus they are characterised as mostly reliable with relevant resilience and hardly probable risk for viability
A	0.80 – 1.00	Indicates factual absence of external and internal problems of the cryptoasset functioning, determined by the indices of the criteria system of the developed model, and thus they are characterised as reliable with high resilience to viability

We are paying attention to the fact that the determined level characterises the cryptoasset viability for a specific time of its assessment. The factors effect and changes in the criteria indices are of vital importance for dynamics of the cryptoasset viability, and thus influence indirectly the level of its viability.

The integral assessment can be given in the percentage ratio: 0.01 corresponds to 1%, 1.00 corresponds to 100%.

Let us consider the technique of determining the level of the cryptoasset viability by example.

It is worth noting that in our work we take a neutral position on the lack of electoral advantage of one cryptoasset over another. Therefore, we will not specify the name of the cryptoasset for which the calculations are made.

The integral indicator for assessing the level of the cryptoasset viability (I_{CV}) is determined as:

$$I_{CV} = \sum_{k=1}^m \alpha_k \times \left(\sum_{i=1}^n \beta_{ik} \times \left(\sum_{j=1}^s V_{jik}/2 \right) \right) = \sum_{k=1}^m I_k \quad (1)$$

α_k – the significance of the k-factor in a system of factors ($\sum_{k=1}^m \alpha = 1$), rel. units;

β_{ik} – the significance of the i-criterion in the k-factor ($\sum_{i=1}^n \beta = 1$), rel. units;

V_{jik} – the value of the j-indicator of the i-criterion in the k-factor, points;

I_k – the aggregate indicator for determining the level of cryptoassets viability by the k-factor;

$k = 1, 2, \dots, m$ – quantity of factors;

$i = 1, 2, \dots, n$ – quantity of criteria;

$j = 1, 2, \dots, s$ – quantity of indices.

An example of calculating aggregate indices to determine the level of the cryptoasset viability:

- by network factor I (NF):

$$I(NF) = 0.16 \times \left(0.281 \times \frac{1+1}{2} + 0.256 \times \frac{0.6+0}{2} + 0.244 \times \frac{0+1}{2} + 0.219 \times \frac{0.6+0.6}{2} \right) = 0.045 + 0.012 + 0.020 + 0.021 = 0.098 \text{ points.}$$

- by social factor I (SF):

$$I(SF) = 0.14 \times \left(0.521 \times \frac{0.6+1}{2} + 0.479 \times \frac{0.6+0.8}{2} \right) = 0.058 + 0.047 = 0.105 \text{ points.}$$

The aggregate indices for other factors are calculated similarly, on their basis, an integral indicator is calculated for assessing the level of the cryptoasset viability:

$$I = 0.105 + 0.092 + 0.098 + 0.094 + 0.105 + 0.130 + 0.104 = 0.728 \text{ points.}$$

The obtained assessment corresponds to the B-level of the cryptoasset viability, i.e. the cryptoasset shows its viability by 72.8%.

Overall, the cryptoassets viability is defined by its ability to survive on a regular basis, and it must take into consideration the entirety of components/indices of integrity determined in the model, that enables making a conclusion about its resiliency, mobility, adaptability to new conditions, ability to preserve its value, efficient organisation, and productivity of its activity on the market, reliability of founders of this cryptoasset, investment attractiveness.



The developed model allows realising complex viability assessment of any cryptoasset or group of cryptoassets from the pool consisting of more than 2,000 assets, which currently take part in trades.

4. DISCUSSION

Assessing and choosing a programme ecosystem of blockchain is becoming more and more difficult every year. An increased number of products is appearing at the market which are based on the blockchain technology with different functionality. Cryptoassets, based on the blockchain technology, demonstrate a fast-moving growth in their variety, the key ones among them have their own peculiarities.

This work deals with the proposed methodology that enables realising system assessment of any type of the cryptoasset, regardless of the specific character laid in it, based on its factor-criterion analysis.

The problem of cryptoassets assessment, determining criteria and indices, is relevant in modern studies of scientists, who considered it according to the aspects of their problematics.

The attempts are made in the research to assess different types of cryptoassets. For example, the authors [24] developed the model of price setting in bitcoins, they gave mixed data about the possibility of the model to explain the prices in bitcoins.

The scientists [25] considered assessment of bitcoins and decentralised network assets with the help of the balance model.

The author [26] developed classification of virtual assets which allows identifying advanced instruments aiming at property rights accounting. This author outlines a group of tokenised assets, which due to the direct connections to property, allow keeping count, as well as rediscounting property and rights in modern digital accounting systems – decentralised information platforms based on the technology of the distributed ledger (blockchain).

Other research deals with the analysis of the blockchain effect and technologies connected with it, on other spheres of finance. For example, some academics [27] studied the consequences for the central bank.

The scientists [28; 29] researched expenditures for mining.

The premium for shares risk based on the usage of technical indicators were forecast in [30].

The possibility to forecast the cryptoasset profit by the means of upstage technical indices were studied in [31].

Finally, the authors [32] proposed a hierarchical model of taking decisions to realise the way users take decisions concerning the cryptocurrency. This model has four main

perspectives: economic, technical, social, and personal, which consist of a set of interrelated criteria.

However, there are practically no studies in the modern scientific literature on assessment of the cryptoasset viability. Among these few publications is the dissertation thesis [33], on evaluating the viability of cryptocurrencies within the legal regime for electronic payments in English law. This author concludes that “given the growing decline in cash use, cryptocurrencies are a viable alternative online payment instrument inbuilt with more robust protections and encouraging participation”. “The policymaker must first objectively assess the benefits that cryptocurrencies introduce into the payments system”.

So, the research mentioned above is of intuitive nature of determining factors and criteria of cryptoassets or is grounded on the analysis of single factors of “political”, “legal” or “technical” criteria-indices, that does not allow estimating the characteristic features of the cryptoasset phenomenon and assessing its viability integrally.

A system approach to the cryptoassets study enables characterising this phenomenon as a complicated system object.

Lately, scientists have studied theoretical groundings of the definitions of “cryptoasset” and “cryptocurrency”, which are frequently used as synonyms.

The following interpretations are used in the countries of the EU and the USA.

A cryptoasset is “a new type of asset recorded in digital form and enabled by the use of cryptography that is not and does not represent a financial claim on, or a liability of, any identifiable entity” [34].

A cryptoasset “denotes digital assets that use cryptography for security and are coins or tokens of distributed ledgers and/or blockchains, including asset-backed tokens” [35].

The latest analysis on the essence of the notions allowed us to make our own improvement.

The cryptoasset is a kind of the asset in the digital format, created on the base of the distributed ledger technology or similar technology, protected by the cryptographic code, it is used for savings or anonymous transactions carried out independently of the Central bank.

It is revealed that several statistical properties of the market have been stable for many years, though new cryptoassets appear and gradually disappear, and their market capitalisation increases super-exponentially. This includes the quantity of active cryptoassets, distribution of the market part and the cryptoassets turnover.

Despite the increase in its relevance in the financial sphere, there is a lack of comprehensive analysis of the system of factors and criteria since most studies are



concentrated entirely on the behaviour of one or more cryptoassets.

One of the main problems in monitoring the cryptoasset market lies in the fact that basically available data about cryptoassets are incomplete and not fully reliable for the purposes of monitoring the market tendencies with the degree of details necessary to estimate their risks [36].

In this paper, we are touching upon a range of key subjects arising from functioning of the cryptoassets market, formulating the main theoretical statements that can be used to classify cryptoassets and allow us to investigate this phenomenon as a complex system object and evaluate the cryptoassets viability on this basis.

Considering the experience of predecessors, their understanding of significant and insignificant characteristics of the cryptoassets concept, and our own experience, in this study we systematised the accumulated data, determined a system of factors, criteria and indices of cryptoassets, developed a factor-criterion model for assessing the cryptoassets viability on their basis.

5. CONCLUSIONS

The study of cryptoassets by the methods of factor-criterion analysis allowed us to characterise a system consisting of 7 factors, 30 criteria and 60 indices. The determined factors, criteria and indices are taken as a basis for the developed model of assessment of the cryptoassets viability.

The factor-criterion model for assessing the cryptoassets viability can be a unique tool for measuring the level of both each component of the cryptoasset in this model and in the integrated unity. Owing to this approach, it is possible to carry out two operations at the same time – to decompose the holistic process of assessing the cryptoassets viability into its simplest components in the form of separate criteria and integrate immediately the results into the unity which characterises the level of the cryptoasset viability.

It should be noted that to assess and understand the cryptoasset viability, it is necessary to study not only the indices of separate criteria, but also their relations and interaction. Coordination of a complex of purposefully chosen criteria will provide the real result – increase in the level of the cryptoasset viability. So, the core factor of the developed system of factors and criteria is the result.

The conducted study is not limited to all the aspects of the problem concerning determining the system of factors and criteria of cryptoassets, as well as methods for assessing their viability. Further research will be aimed at development of methodological and technological support, which allows solving theoretical and practical issues related to the identification of opportunities for the influence of various factors on the value of cryptoassets.

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REFERENCES

- [1] I. S. Pypenko and A. A. Kud, "Genesis of IT economy: from cryptocurrency to digital asset", *International Journal of Education and Science*, vol. 2, no. 2, p. 56, 2019, <https://doi.org/10.26697/ijes.2019.2.41>
- [2] I. S. Pypenko and Yu. B. Melnyk, "Principles of digitalisation of the state economy", *International Journal of Education and Science*, vol. 4, no. 1, pp. 42–50, 2021, <https://doi.org/10.26697/ijes.2021.1.5>
- [3] I. S. Pypenko, "Digital product: the essence of the concept and scopes", *International Journal of Education and Science*, vol. 2, no. 4, p. 56, 2019, <https://doi.org/10.26697/ijes.2019.4.41>
- [4] O. Ali, M. Ally, P. Clutterbuck, and Y. Dwivedi, "The state of play of blockchain technology in the financial services sector: a systematic literature review", *International Journal of Information Management*, vol. 54, October 2020, <https://doi.org/10.1016/j.ijinfomgt.2020.102199>
- [5] I. S. Pypenko and Yu. B. Melnyk, "Creating a business ecosystem based on blockchain technology", *International Journal of Education and Science*, vol. 3, no. 4, p. 53, 2020, <https://doi.org/10.26697/ijes.2020.4.26>
- [6] S. Helmer, M. Roggia, N. E. Ioini, and C. Pahl, "EternityDB – Integrating database functionality into a blockchain", in *Communications in Computer and Information Science*, vol. 909, A. Benzúr, B. Thalheim, and T. Horváth, Eds. New York: Springer, 2018, pp. 37–44, https://doi.org/10.1007/978-3-030-00063-9_5
- [7] N. Papakostas, A. Newell, and V. Hargaden, "A novel paradigm for managing the product development process utilising blockchain technology principles", *CIRP Annals*, vol. 68, no. 1, pp. 137–140, 2019, <https://doi.org/10.1016/j.cirp.2019.04.039>
- [8] P. Bhaskar, C. K. Tiwari, and A. Joshi, "Blockchain in education management: present and future applications", *Interactive Technology and Smart Education*, vol. 18, no. 1, pp. 1–17, 2021, <https://doi.org/10.1108/ITSE-07-2020-0102>
- [9] Yu. B. Melnyk and I. S. Pypenko, "How will blockchain technology change education future?!", *International Journal of Science Annals*, vol. 3, no. 1, pp. 5–6, 2020, <https://doi.org/10.26697/ijssa.2020.1.1>
- [10] I. Radanović and R. Likić, "Opportunities for use of blockchain technology in medicine", *Applied Health Economics and Health Policy*, vol. 16, pp. 583–590, 2018, <https://doi.org/10.1007/s40258-018-0412-8>
- [11] H. M. Hussien, S. Yasin, N. Udzir, M. I.Ninggal, and S. Salman, "Blockchain technology in the healthcare industry: trends and opportunities", *Journal of Industrial Information Integration*, vol. 22, June 2021, <https://doi.org/10.1016/j.jii.2021.100217>
- [12] Z. Turk and R. Klinc, "Potentials of blockchain technology for construction management", *Procedia Engineering*, vol. 196, pp. 638–645, 2017, <https://doi.org/10.1016/j.proeng.2017.08.052>
- [13] Yu. B. Melnyk, "Cryptocurrency possibilities in target financing of public social payments", *International Journal of Education and Science*, vol. 2, no. 2, p. 55, 2019, <https://doi.org/10.26697/ijes.2019.2.40>
- [14] F. Mueller and F. Squartini, "Cryptocurrencies: threats and applications from a monetary economic perspective", *International Scholars Journal of Arts and Social Science Research*, vol. 2, no. 4, pp. 69–78, 2020, <https://www.theinterscholar.org/journals/index.php/isjassr/article/view/63>

- [15] T. M. Navamani, "A review on cryptocurrencies security", *Journal of Applied Security Research*, June 2021, <https://doi.org/10.1080/19361610.2021.1933322>
- [16] The European Banking Authority, "Report with advice to the European Commission on crypto-assets", 2019, <https://www.eba.europa.eu/eba-reports-on-crypto-assets>
- [17] Xaurum Official, "The difference between cryptocurrency and digital assets, and why should holders care?" *Medium*, March 2018, <https://medium.com>
- [18] Financial Action Task Force, "Virtual currencies – key definitions and potential AML/CFT risks", Paris: FATF/OECD, 2014, <http://www.fatf-gafi.org>
- [19] I. S. Pypenko and Yu. B. Melnyk, "Systematic approach to the classification of the system of cryptocurrency criteria", *International Journal of Education and Science*, vol. 3, no. 1, pp. 30–40, 2020, <https://doi.org/10.26697/ijes.2020.1.3>
- [20] A. Spithoven, "Theory and reality of cryptocurrency governance", *Journal of Economic Issues*, vol. 53, no. 2, pp. 385–393, 2019, <https://doi.org/10.1080/00213624.2019.1594518>
- [21] M. Polasik, A. I. Piotrowska, T. P. Wisniewski, R. Kotkowski, and G. Lightfoot, "Price fluctuations and the use of bitcoin: an empirical inquiry", *International Journal of Electronic Commerce*, vol. 20, no. 1, pp. 9–49, 2015, <https://doi.org/10.1016/j.techfore.2017.05.025>
- [22] A. Pazaitis, P. D. Filippi, and V. Kostakis, "Blockchain and value systems in the sharing economy: the illustrative case of Backfeed", *Technological Forecasting and Social Change*, vol. 125, pp. 105–115, 2017, <https://doi.org/10.1016/j.techfore.2017.05.025>
- [23] B. Goertzel, T. Goertzel, and Z. Goertzel, "The global brain and the emerging economy of abundance: mutualism, open collaboration, exchange networks and the automated commons", *Technological Forecasting and Social Change*, vol. 114, pp. 65–73, 2017, <https://doi.org/10.1016/j.techfore.2016.03.022>
- [24] S. Athey, I. Parashkevov, V. Sarukkai, and J. Xia, "Bitcoin pricing, adoption, and usage: theory and evidence", *Stanford University*, 2016, <https://siepr.stanford.edu>
- [25] E. Pagnotta and A. Buraschi, "An equilibrium valuation of bitcoin and decentralized network assets", March 2018, <http://dx.doi.org/10.2139/ssrn.3142022>
- [26] A. A. Kud, "Comprehensive classification of virtual assets", *International Journal of Education and Science*, vol. 4, no. 1, pp. 52–75, 2021, <https://doi.org/10.26697/ijes.2021.1.6>
- [27] M. Raskin and D. Yermack, "Digital currencies, decentralized ledgers, and the future of central banking", *Cambridge: National Bureau of Economic Research*, 2016, <https://doi.org/10.3386/w22238>
- [28] D. Easley, M. O'Hara, and S. Basu, "From mining to markets: the evolution of bitcoin transaction fees", *Journal of Financial Economics*, vol. 134, no. 1, pp. 91–109, 2019, <https://doi.org/10.1016/j.jfineco.2019.03.004>
- [29] G. Huberman, J. D. Leshno, and C. C. Moallemi. "Monopoly without a monopolist: an economic analysis of the bitcoin payment system", *Bank of Finland Research Discussion Papers*, 2017, <https://doi.org/10.2139/ssrn.3025604>
- [30] C. J. Neely, D. E. Rapach, J. Tu, and G. Zhou, "Forecasting the equity risk premium: the role of technical indicators", *Management Science*, vol. 60, no. 7, pp. 1772–1791, 2014, <https://doi.org/10.1287/mnsc.2013.1838>
- [31] J.-Zh. Huang, W. Huang, and J. Ni, "Predicting bitcoin returns using high-dimensional technical indicators", *The Journal of Finance and Data Science*, vol. 5, no. 3, pp. 140–155, 2019, <https://doi.org/10.1016/j.jfds.2018.10.001>
- [32] S. Alzahrani, and T. U. Daim, "Evaluation of the cryptocurrency adoption decision using hierarchical decision modeling (HDM)", in *2019 Portland International Conference on Management of Engineering and Technology (PICMET)*, 2019, pp. 1-7, <https://doi.org/10.23919/PICMET.2019.8893897>
- [33] K. Udofa, "Evaluating the viability of cryptocurrencies within the legal regime for electronic payments in English law", *Doctoral dissertation*, University of Sheffield, 2020, <https://etheses.whiterose.ac.uk/28416>
- [34] The European Central Bank, "Understanding the crypto-asset phenomenon, its risks and measurement issues", *Economic Bulletin*, iss. 5, 2019, https://www.ecb.europa.eu/pub/economic-bulletin/articles/2019/html/ecb.ebart201905_03~c83aeaa44c.en.html#toc5
- [35] International Monetary Fund, "Regulation of crypto assets: FinTech notes". Washington, DC: International Monetary Fund, December 2019, <https://www.imf.org/en/Publications/fintech-notes/Issues/2020/01/09/Regulation-of-Crypto-Assets-48810>
- [36] The European Central Bank, "Crypto-assets: implications for financial stability, monetary policy, and payments and market infrastructures", May 2019, <https://www.ecb.europa.eu/pub/pdf/scpops/ecb.op223~3ce14e986c.en.pdf>



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