

Визначення реальної вартості цифрових активів для цілей бухгалтерського обліку

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Анотація. Проведене дослідження пов'язане з визначенням підходів до оцінки реальної вартості цифрових активів, що отримані підприємством, контролюються ним і беруться на облік за тією чи іншою вартістю. Основна мета дослідження полягає у визначенні параметрів оцінки вартості отриманого активу від виду операцій (майнинг, бартер). У статті використовується метод опису, що дозволив встановити певні особливості облікового відображення криптовалюти в обліку залежно від виду операцій, визнання та варіанту оцінки вартості такого активу. Проаналізовано основні операції із використанням криптовалюти. Встановлено, що під час здійснення транзакцій із віртуальними валютами, криптовалютою, цифровими активами, особливу увагу варто приділити вимірюванню споживчої вартості певних товарів (активів). Проаналізовано різні підходи щодо застосування виміру споживчої вартості активів. Розглянуто можливості застосування основних видів вартості, встановлено, що ні одна вичерпно не розкриває сутності вимірювання споживчої вартості цифрових активів, віртуальної валюти, криптовалюти. Запропоновано та обґрунтовано введення нового виду вартості, як атрибутивна. Розкрито основні варіанти оцінки криптовалюти залежно від операцій із такими активами та рекомендовано варіанти використання того чи іншого виду оцінки вартості. Здійснено обчислення атрибутивної вартості залежно від певних видів операцій. Встановлено, що запропонована атрибутивна вартість відображає пряму залежність від доходу та від реалізації активу, собівартості отриманого такого активу та його визнання для цілей оподаткування. Наведено реальний приклад розрахунку та застосування атрибутивної вартості за монетою Bitcoin Cash для складання звітності під час дооцінки активу

Ключові слова: об'єкт обліку, цифрові валюти, ідентифікація, облік криптовалюти, атрибутивна вартість, справедлива вартість

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Determining the Fair Value of Digital Assets for Accounting Purposes

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Abstract. The conducted study is related to the definition of approaches to assessing the actual costs of digital assets received by an enterprise, controlled by it and accounted for at a particular value. The purpose of the study is to determine the parameters for estimating the value of the received asset from the type of operations (mining, barter). The paper uses the description method, which allows establishing certain features of the accounting reflection of cryptocurrencies in accounting, depending on the type of operations, recognition and the option of estimating the value of such an asset. The main operations using cryptocurrencies are analysed. It is established that when making transactions with virtual currencies, cryptocurrencies, and digital assets, special attention should be paid to measuring the consumer value of certain goods (assets). Various approaches to measuring the consumer value of assets are analysed. The possibilities of applying the main types of value are considered, and it is established that none of them exhaustively reveals the essence of measuring the consumer value of digital assets, virtual currency, or cryptocurrencies. The introduction of a new type of value as an attribute value is proposed and substantiated. The main options for evaluating cryptocurrencies depending on operations with such assets are disclosed and options for using a particular type of value assessment are recommended. The attribute value is calculated depending on certain types of operations. It is established that the proposed attribute value reflects a direct dependence on income and on the sale of an asset, the cost of such an asset received and its recognition for tax purposes. A real example of calculating and applying the attribute value of a Bitcoin Cash coin for reporting when revaluing an asset is given

Keywords: accounting object, digital currencies, identification, cryptocurrency accounting, attribute value, fair value

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Introduction

To support innovation in the financial sector of Ukraine, it is necessary to develop principles for regulating the cryptocurrency market and prevent the criminal use of virtual currencies. First of all, licensing of business activities with virtual currency should be introduced. At the same time, licenses should be granted only if consumer protection is ensured, money laundering is prevented, and cybersecurity requirements are increased when working with cryptocurrencies. In order to de-shadow this sector, it is necessary to amend the tax code of Ukraine regarding the inclusion of income from operations with virtual currency in the objects of personal income tax.

The identification and recognition of an object in accounting, one or another type of asset, depends on its further accounting and determination of the tax base and reflection in the financial statements. In addition, it is especially important to study the satisfaction of needs with cryptocurrency. Cryptocurrency users have found in it a tool for saving savings from inflation, ease of use and anonymity. Therefore, it is important to study the formation of value of cryptocurrencies, since in the future it is not clear which method is worth using when measuring the value of such an asset.

In addition, organisations that work with virtual currencies in Ukraine must report suspicious transactions of their clients, which for its part will contribute to compliance with international standards on countering money laundering and terrorist financing and the proliferation of weapons of mass destruction FATF (*Financial Action Task Force*) [1]. Consequently, this will ensure the implementation of the tasks of the comprehensive programme for the development of the financial sector of Ukraine until 2021, related to the need to introduce financial and technological innovations and ensure transparency in the measurement of fair value. When making transactions with virtual currencies, cryptocurrencies, and digital assets, special attention should be paid to measuring consumer value. Each participant of the blockchain network in cryptocurrency finds satisfaction of their own needs.

V. Dyba considered theoretical approaches to estimating the value of intangible assets by various methods of obtaining calculated values, identified economic and accounting aspects that integrate various factors influencing the value of these assets. The author suggests that the category of value of intangible assets should be considered in two ways as: 1) a sign of costs for the production of an intellectual product, which is a quantitative characteristic of its consumer value expressed in money; 2) an economic category for assessing the usefulness of the results of social production of knowledge [2]. That is, in modern conditions, knowledge becomes a source of value, replacing labour as a source of added value.

V. Babailov and D. Prikhodko proved that need is not a source of value formation – it only serves as a trigger for the mechanism of labour costs, the so-called “use value”, which is not a value at all. The study analysed the establishment of labour costs as the only and true source of formation of any value in order to determine clear boundaries. This allows clarifying the subject of economics and ridding it of its uncharacteristic functions and, ultimately, leads to an increase in the efficiency of economic activity [3]. O.S. Streltsov, V.A. Cherkasov studied the economic essence of enterprise value and its management concepts. The analysis of interpretations of the concept of enterprise value by content and essential features in scientific and scientific-practical literature was carried out. The study determined the main characteristics of the enterprise's value as an object of management activity. The author's vision of the essence of the value of the enterprise and its management features was proposed. The origin of the theory of enterprise management, which takes into account its value, was analysed [4].

H. Han, Yu. Yuan, F. Wang studied the approaches of central banks around the world (USA, Canada, Austria, Netherlands) regarding the monetary consequences of cryptocurrency recognition. Researchers paid special attention to the study of the social factor of using cryptocurrencies by individuals. Researchers conducted a survey to what extent respondents are willing to use a new type of digital asset [5]. M. Wang, M. Han, V. Huang found that a weak information environment can negatively affect the use of new assets. The authors made a relationship between the queries “cryptocurrency” in the Google search network and the actual exchange rate of cryptocurrencies to fiat money [6]. J. Lee, Yu. Yuan, F. Wang conducted research on the establishment of the current exchange rate for cryptocurrencies in Ethereum, studied the mining process and found that linear regression and polynomial regression are used to predict the next block of remuneration to the miner during the mining of the Ethereum cryptocurrency. It was proposed to distinguish cryptocurrencies by the line of use, which further affects their recognition in accounting [7]. M. Della Seta, E. Morelek, F. Tsuki found that short-term debt curbs moral risk and demonstrates that in a world where there is friction over financing and fair debt prices, short-term debt creates incentives to take risks. Investing in cryptocurrencies has an increased risk, since it is impossible to predict a further increase or decrease in activity on the crypto exchange of a particular coin, but the yield on such risky operations is an order of magnitude higher. Therefore, shareholders take a favourable risk and consider cryptocurrency as an asset that can bring certain benefits in the future [8].

Despite all the scientific developments in the topic

of determining value, it is still poorly understood how to determine the value of a mining farm that creates digital assets. It is also unclear exactly how it is possible to apply well-known approaches in the valuation of property and intangible assets, such as cryptocurrencies, crypto assets, cryptocurrencies and digital assets, and tokens, to modern money. Thus, *the purpose of the study* consists in forming a definition of the real value of digital assets for accounting purposes, including the operations for which the cryptocurrency was received and by what parameter to estimate the value of the received asset. *The research objective* consists in studying the main approaches to assessing the value of cryptocurrencies, followed by the establishment of approaches to taxation of transactions, since when controlling such assets, it is necessary to pay taxes, the calculations of which are based on the initial or other value of assets.

Materials and Methods

In the course of the study, the description method was used to record certain features of the accounting reflection of cryptocurrencies in accounting. This allowed expanding the understanding of how digital assets (cryptocurrencies) should be recognised and identifying a new approach to value estimation, such as attribute value, which belongs only to cryptocurrency assets or digital assets.

The study is based on the analysis of regulations regarding the application of certain approaches to assessing property value. Among them, IFRS 13 "Fair Value Measurement", National Standard No. 1 "General principles of valuation of property and property rights", the Tax Code of Ukraine. Regulations standardise the procedure for evaluating and recognising certain assets and regulate the application of the value assessment itself. The scientific method of analysis made allowed determining the list of options for estimating objects of value, which later allowed identifying a new method for estimating the value of digital assets. A detailed analysis of the use of different methods of valuation revealed a discrepancy between the methods used for digital assets. The relationship between the recognition of an object and its taxation is established.

The complexity of the value measurement lies in the fact that under various conditions that contribute to the acquisition of a digital asset, the object of taxation also changes. Therefore, the recognition of digital assets was highlighted and the main operations with such assets in the enterprise were investigated. Three main operations related to assets are considered: registration, disposal, and reflection in the financial statements. Analysis and synthesis allowed forming a new approach to assessing the value of digital assets and in a practical way determining the value of such an asset using a new approach, forming research conclusions.

The use of a scientific comparison allowed establishing the relationship between the recognition of a cryptocurrency and the use of a certain approach in evaluating such an asset, depending on the operation that affected the control of such an asset. The measurement method allowed the study to establish a tax base and identify types of taxes and their rates when taxing digital assets. The results of previous studies and the synthesis and generalisation allowed determining the process of taxation of digital assets, identifying the types of taxes and their main rates.

Results and Discussion

Use value – a value for a particular user based on obtaining utility. Utility can be based on expected benefits, revenue, or the use of increased value. Consumer value depends on the user's specific judgments, standards, or requirements. Therefore, use value is synonymous with subjective value. Consumer value does not depend much or does not depend at all on finding out information about the market. It is considered and evaluated in legal disputes about the amount of compensation to the owner during its withdrawal or causing losses [9].

Fair value in the system of the International Financial Reporting Standard (IFRS) is devoted to a separate, rather specific standard – IFRS 13 "Fair Value Measurement", which defines that fair value is the price that can be obtained for the sale of a certain asset in a purchase/sale operation on the date of such operation. The main condition is that it is necessary to declare the price as openly as possible and compare the declared price with the price of an identical product from open sources of information [10].

Therefore, the fair value is based on determining the market price and does not take into account the specifics of the object being sold. For example, when comparing the cost of 1 gramme of gold and 1 litre of water, there is no doubt that the cost of precious metal (gold) will be higher. However, if the market conditions are significantly changed and such objects are compared in the conditions of a blazing hot Sahara Desert, it can be affirmed that a person would choose 1 litre of drinking water, instead of 1 gramme of gold. Therefore, it is important to determine the open market information and the conditions in which a particular resource asset is evaluated. The purpose of a fair valuation is to apply fair value in both conditions that should be considered common in the market. But it is important to understand what exactly are the usual conditions of the cryptocurrency market, for its implementation, acquisition, or exchange [11].

Considering fair value in terms of the accounting valuation category, it can be argued that the value of an asset is equal to the value of liabilities at a certain date and time. Because economists understand that USD 100

yesterday and today, and three days later are different USD 100, not at par value, but in practical (real). Market value – the value to which the seller agrees when selling an asset and the buyer when receiving such an asset, who is willing to pay the specified amount deliberately and without compulsion [12]. The market value can only be determined for such property that can be transferred from one party to another.

To use the market value of an asset valuation, there are three main calculation approaches. The first approach is based on market research. It is based on comparing prices for products that are identical or similar, but are represented on the market by different buyers. The second approach is called income-based, which is based on the fact that the received property (asset) in the future could bring the owner a certain income from its maintenance. The third approach is called cost-based, based on determining the cost of creating such property. Therefore, further research may be related to the definition of digital cost, which is adaptive exclusively for digital assets.

For example, the market value is an estimate of such a digital asset, a certain crypto coin costs, for example, UAH 100, the market price for it is UAH 150, and the cost of its production at the moment is UAH 120. The sale of such a coin would bring UAH 30 of income (150-120). However, the situation on the crypto coin market is constantly changing and it is appropriate to use market valuation only for a specific asset at a certain time, but it is impossible to use the first and second approaches. Since the change in the conditions for creating a new crypto coin, due to the increase in the cost of electricity in Ukraine increases the prime cost, which reduces income, and whether it will be profitable in the market for an individual or a legal entity to purchase such a coin on a Ukrainian or foreign crypto exchange that was created (extracted) in Portugal, provided that electricity in that country is cheaper than in Ukraine.

According to the Ukrainian national valuation standards, there are the following main types of value (the value can be measured and expressed in the amount of cash):

- market value – the cost of purchasing a particular asset at a reasonable price that suits the buyer;
- present value – the value of an asset at a specific date and time of its valuation. Usually, the actual price valid on a specific date is used;
- liquidation value – the value of alienation of an object, provided that there is a certain period of operation of the object until the moment of disposal and write-off. This variety is adaptive to objects that have been in operation and are represented on the secondary property market;
- reproduction cost – the current amount of costs for creating such an asset at this particular time, taking into

account current conditions;

- special value – calculation of the value of an asset based on the market value with the addition of the seller's premium;
- estimated cost – the cost determined by the established algorithm and depends on the input data involved in the calculation.

Of the above value variations, none reflects the real value of the cryptocurrency in order to determine exactly for how much money one person would agree to transfer their crypto assets to another. In other words, it is proposed to introduce an additional type of value, such as attribute value. "Attribute value" should be understood as the necessary essential inherent property of an item assigned to a particular digital asset at the time of alienation. This is a new economic assessment in the digital economy.

The exchange rate of a cryptocurrency expressed in monetary terms by the value of a particular crypto coin in dollar terms does not reflect its real value, since there is high volatility of such assets. Therefore, it is necessary to use the attribute value to express a certain value of the crypto coin in monetary terms. According to the goals of holding such digital assets, it is necessary to apply a certain approach to determining the value. Depending on operations with cryptocurrencies, it is suggested to use the following types of value. Thus, when conducting operations for depositing and crediting crypto coins to the balance sheet of an individual or enterprise, the initial cost must be used. If any person has decided to keep their savings in cryptocurrency, then it is necessary to apply an attribute value to operations to save value.

When determining the object of taxation, depending on the purpose of storing and accumulating cryptocurrencies, it must be recognised as a payment instrument or a credit instrument (financial investment). If cryptocurrencies are recognised as a commodity, then during operations using such a medium of exchange, such assets are recognised as goods and credited to the balance sheet at fair value. At the reporting stage, it is necessary to evaluate all digital assets at an overvalued value. Therefore, revaluation operations during the occurrence of an increase in the value of an object, it is necessary to carry out a revaluation, which in the future should be recognised as passive income. Thus, the tax base for such operations with cryptocurrencies will be passive income, at the basic passive income rate of 5%. When drawing up reports, if the accounting object, which is a crypto product (crypto coins), is recognised as a commodity in the implementation of certain operations, then such a specific product must be evaluated at the lowest cost.

When performing operations with cryptocurrencies and digital assets related to the disposal of such

accounting objects, it is necessary to evaluate them by the repayment value. Consequently, there is an increase in the market value of capital – this is an increase in the cost of assets. When it comes to taxation, it is usually defined as net income from the sale of assets or income from the sale of an investment or property. Therefore, it is necessary to tax such operations with cryptocurrencies related to asset disposal and capital gains at the usual income tax rate of 18% and a military tax of 1.5%. When performing operations with cryptocurrencies

and recognising such operations with cryptocurrencies as barter transactions, it is necessary to apply the basic income tax rate of 18% and 1.5% of the military tax. Table 1 shows the main options for evaluating cryptocurrencies when performing certain operations with such assets. The main types of operations and definitions of such assets in accounting, in relation to their recognition, are analysed. The main options for estimating the value depending on the recognition of digital asset accounting objects are given.

Table 1. The main options for evaluating cryptocurrencies depending on operations with such assets

Type of operation	Recognised as	Valuation option	Taxation
Depositing (crediting to the balance)	Crypto asset, digital asset	Initial cost	18% PIT*; 18% income tax; 1.5 MT*
	Payment instrument, credit instrument, financial investment (store of wealth)	Attribute value	(5%, 9%, 18%) dividend, 18% income tax; 1.5% MT
	Medium of exchange – crypto product (commodity)	Fair value	20% VAT*
Preparation of reports	Crypto asset, digital asset	Revalued cost	20% VAT, but if it is retired or used in non-economic operations
	Payment instrument, credit instrument, financial investment (store of wealth)	Attribute value	Additional assessment (passive income) – 5%
	Medium of exchange – crypto product (commodity)	Lowest cost	No data available
Disposal of digital assets	Crypto asset, digital asset	Real cost	20% VAT (retiring or further use in non-economic operations)
	Payment instrument, credit instrument, financial investment (store of wealth)	Repayment process	Capital gains of 18%; 1.5% MT
	Medium of exchange – crypto product (commodity)	Barter agreement	Income tax 18%; 1.5% MT

Note: * PIT – personal income tax; MT – military tax; VAT – value added tax

Source: compiled by the authors

Next, the study considers the recognition of cryptocurrencies as an intangible asset. When performing sales operations with such an asset, it is necessary to reflect its disposal in the accounting records. The sale of a cryptocurrency, which is recognised as an intangible asset, is subject to VAT. The tax base is the contractual (actual) value, but not lower than the book value according to accounting data (clause 188.1 of the Tax Code of Ukraine). Therefore, in the case of a cheap sale, the residual value of an intangible asset has a direct impact on the amount of VAT liabilities. And markdowns/revaluations directly affect the residual value. That is, markdowns, reducing the book value, also reduce the VAT base. And additional valuations – increasing the accounting value,

increase the VAT calculation base [13].

The payer is obliged to charge compensating tax liabilities if the intangible asset is intended for use or begins to be used in non-taxable/non-economic operations (of course, if a tax credit was formed during their acquisition) (clause 198.5 of the Tax Code of Ukraine) [14]. According to the tax legislation of Ukraine, when determining the tax base, a balance sheet approach is applied, which is based on a preliminary estimate of the value that was determined at the beginning of the reporting period. Therefore, additional valuations/markdowns even in this case have a decisive impact on the amount of VAT tax liabilities.

For the purpose of personal income tax, the total

monthly (annual) taxable income of the taxpayer includes passive income, which includes income received in the form of dividends. Taking into account the above, for certain operations with cryptocurrencies where the attribute value is used, the method of determining it is proposed as follows:

$$AV = EB * (1 - T) - S \quad (1)$$

where: *AV* – attribute value; *EB* – income from the sale of a digital asset on a specific date; *T* – tax rate; *S* – the cost of the received digital asset in the past.

An example of calculating the attribute value for the Bitcoin Cash coin for reporting during additional evaluation is presented below. First, it is necessary to define the initial data. Thus, the income from depositing a digital asset on a certain date is USD 254 or UAH 7,112 (as of 06.11.2020). The tax rate is 5%. The cost of the received digital asset in the past – USD 220 or UAH 6,160 (as of 05.10.2020).

$$AV = 7112 * (1 - 0.05) - 6160$$

The attribute value to reflect the additional valuation in the financial statements is UAH 596.4. The main problems are related to accounting for transactions with cryptocurrencies, crypto assets, crypto coins, and digital assets – when they are used during changes and act as a medium of exchange.

It is appropriate to consider the accounting of cryptocurrency exchange operations from two sides. The first side is an exchange for similar assets. That is, when cryptocurrency is exchanged for cryptocurrency (Bitcoin – Bitcoin Cash; Ethereum – XRP). An exchange for non-similar assets is considered an exchange of cryptocurrency for other assets, for example, stablecoins (digital gold, digital oil, digital dollar (Tether), litecoins). For example, the exchange of Bitcoin Cash – Tether; Ethereum – WMZ.

According to Part 2 of Article 715 of the Civil Code [15] and Part 2 of Article 293 of the Economic Code [16], the main participants in the contract (parties) are two sellers and two buyers at the same time. Since the first seller is the seller of a particular product and declares its value, and the other acts as a buyer who agrees with the declared value, but instead of money provides another product and declares such a value that satisfies him as the seller of the second product (buyer of first product) and another person of the buyer of the second product (seller of the first product). As soon as the property (goods) reaches the buyer, property rights are immediately transferred and counterclaims are automatically credited. Special attention should be paid to the date of

transfer/receipt of the goods when performing such a barter operation. Since it is the final operation that closes the obligations under the contract.

The contract mainly specifies the value of the asset (goods, property), taking into account the fair value of barter. However, if it is not possible to reliably provide a value assessment of the alienation of property (digital assets), it is proposed to use the attribute value. As for exchange operations for non-similar assets, it is necessary to reflect two operations in accounting. The first transaction reflects the recognition of an asset and liabilities, and the second – an increase in the value of such an asset by the amount of a monetary supplement for it and the recognition of accounts receivable formed as a result of a sale transaction. After that, in the accounting of the two parties to the agreement, it is appropriate to carry out and reflect the offset of counter-debts.

Conclusions

The list of main types of cost measurement is analysed. It is established that none of them exhaustively reflects the main features of measuring a digital asset. Thus, it is proposed to introduce an additional type of value, an attribute value. This is a new method for estimating the value of digital assets, virtual currencies, and cryptocurrencies. The study substantiates the calculation of such an attribute value based on income from the sale of such an asset on a certain date, the tax rate. For individuals, it is necessary to apply personal income tax; for legal entities, it is appropriate to use income tax. Special attention should be paid to determining the cost of the received digital asset during calculations.

The paper presents the main operations with cryptocurrencies and substantiates the use of each type of value depending on the operation. The main operations with such assets include: depositing (crediting to the balance sheet); reflection of cryptocurrencies during reporting, and disposal of digital assets. Cryptocurrencies, in this case, can be recognised as intangible assets that are registered as a result of past events. Operations as a result of which the company controls such intangible assets can include: acquisition at its own expense, contribution to the authorised capital, or a barter operation related to exchange for a similar or non-similar asset.

Therefore, special attention should be paid to determining the tax base for digital accounting objects. In addition, the issue of establishing the role of state bodies in regulating various transactions that arise between legal entities and individuals on the territory of Ukraine, when the payment instrument is cryptocurrency or other types of virtual money, remains unclear.

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