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VALUATION OF INTANGIBLE ASSETS IN THE CONTEXT OF ECONOMIC INSTABILITY IN UKRAINE

ABSTRACT

The article is devoted to the issues of intangible assets valuation caused by globalization processes, deep digital transformation of economic relations, and, as a result, implementation of the results of innovation and intellectual activity in all spheres of economic activity. Ukraine's current realities include the development and use of innovative software in military operations (artificial intelligence, autonomous systems (unmanned aerial vehicles), software (automated battle management systems, situational awareness systems, digital maps, etc.), in the field of security and defence, ecology, healthcare and rehabilitation of the military and civilians, restoration of energy and transport infrastructure, etc. All of these processes are associated with the generation of intellectual products and intellectual property rights, which are intangible assets by their economic nature and cannot be commercialized without their valuation.

The purpose of the article is to analyze the international experience and national practice of valuation of intangible assets and intellectual property rights in the process of their commercialization, as well as in the accounting and reporting system in the context of economic instability. The author highlights the problems of valuation and disclosure of intangible assets in financial statements, in particular, the need to test them for changes in potential usefulness, given the effects of the global COVID-19 pandemic and the Russian military invasion of Ukraine, which have led to impairment of assets, increased risks and their impact on accounting estimates and disclosures.

The main results of this research are the improvement of methodological approaches to the valuation and testing for changes in the potential usefulness of intangible assets, taking into account the risks associated with the consequences of the COVID-19 pandemic, Russia's military aggression against Ukraine, and global economic uncertainty.

Keywords: innovation activity, intangible assets, intellectual property rights, valuation, fair value, economic uncertainty, reducing the usefulness of assets

JEL Classification: E22, M41, G12

INTRODUCTION

The development of post-industrial society, the intellectualization of the economy, and the spread of the use of modern information and technical technologies in the industry have led to the emergence of Industry 4.0. The elements of production characteristic of "Industry 4.0" lead to an increase in the cost of research and development (R&D) processes, thereby intensifying innovation activities at enterprises of all spheres and industries, contributing to the development of the intellectual property market, production of products in accordance with the requirements of the individual customer by optimizing the cost, improving the quality of automation of the production process. The development of Industry 4.0 contributes to increasing the competitiveness and modernization of the economy, ensuring sustainable production growth, and increasing the technological level based on digitalization. This allows the integration of horizontal and vertical value chains, introducing new business models, and offering significant added value based on individual solutions [1].

The peculiarity of intangible assets is their ability to be used simultaneously as:

- an asset of the enterprise, the value of which affects the capitalization of the company in the market. The value of intangible assets directly affects the market value of companies, and also depends on the industry of the company and the size of the company. For example, in French companies the strength of this correlation ranges from 0.3 to 0.7, in German companies from 0.6 to 0.7, and in British companies from 0.05 to 0.7 [18];
- an asset that is provided for use by other entities (for example, under a sublicense or franchise). According to a study by the Center for International Trade Analysis Trade+ of the Kyiv School of Economics, the sector of royalties and other services related to the use of intellectual property has improved export volumes compared to 2013: in 2019, the volumes amounted to USD 33.3 million. USD, which is 36.0% or USD 8.8 million higher than in 2013. USD higher than in 2013 [36].

In this regard, the demand for the valuation of intangible assets, in particular intellectual property rights, is growing rapidly. The relevance of intangible asset valuation is also evidenced by recent European studies [3; 10; 23; 41].

The timeliness of the study of the identification and valuation of intellectual property rights embodied in intangible assets is enhanced by the development and implementation of the plan for the post-war economic recovery of Ukraine, which was joined by leading scientists, experts, and foreign specialists. They have broadly discussed related issues and identified key principles of international integration and support, in particular: Ukraine's movement towards the European Union; the development of a reconstruction program based on assistance in foreign capital inflows and international technology transfer, investment in the development of modern innovative products based on intellectual property rights embodied in them [4].

Valuation of intangibles is important for tax purposes. Expert valuation of intangible assets is used in transfer pricing. From the perspective of international taxation, more and more attention is paid to how and where profits derived from intangible assets should be taxed. The valuation of such assets is a multifaceted process, especially in relation to hard-to-value intangibles (HTVI) in transactions between members of an international corporate group.

Given the intangible nature, uniqueness of intangible assets, and a variety of approaches to their valuation in the accounting and reporting system, for the purposes of certain civil law transactions with them, transfer pricing has certain valuation specifics related to the use of forward-looking information.

The absence of intangible substance and the uniqueness of each intellectual property right object, the ability to obsolescence and increased risks of impairment contribute to the asymmetry of information about their value, which necessitates the constant evaluation of intangible assets to determine their real market value [41].

Two models of asset valuation prevail in the accounting system: at actual cost (cost model) and at revalued cost (revaluation model) [25]. Accounting for intangible assets at revalued amounts means that after initial recognition, an intangible asset should be carried at a revalued amount, which is its fair value at the date of revaluation less any subsequent accumulated amortization and any subsequent accumulated impairment losses. For revaluation under this Standard, fair value should be determined by reference to an active market. The establishment of the revalued amount is based on the definition of fair value, which according to IFRS 13 "Fair Value Measurement" provides for the following valuation techniques: market, cost and income approach [19]. It should be noted that for unique intangible assets, such as patents and trademarks, there is practically no active market, many types of such assets cannot be revalued, despite the fact that their market value can be determined by an independent appraiser.

Since the beginning of 2020, most countries in the world have introduced strict measures to contain the spread of the COVID-19 coronavirus [15; 21]. Since the beginning of 2022, the Russian Federation has launched military aggression on the territory of Ukraine, thereby destroying many infrastructure buildings, causing significant losses to companies, as well as reducing the value of assets of enterprises, including intangible ones. This has a significant impact on the economic activity of companies and makes certain adjustments to the normal business operations of companies around the world - especially those that:

- have experienced a drop in demand for their products or services or restrictions imposed by the government;
- depend on supply chains or have production facilities in countries that have been significantly affected by COVID-19;
- trade with countries that have been significantly affected by COVID-19 [5];
- depend on the Russian or Belarusian markets;
- have subsidiaries or assets in Russia, Belarus, or in the war zone;
- have related parties under sanctions.

The rapid deterioration of the economic environment and increased uncertainty in the macroeconomic and business outlook has resulted in the occurrence of events that may cause the assets to be impaired, thus requiring an impairment test.

LITERATURE REVIEW

Trends in the development of economic systems, in particular the intellectual property market, as well as "industry 4.0" are highlighted in the works of many scientists, including Amosha, O.I., Pidorycheva, I.Yu., and Zemliankin, A.I. [1], Kagermann H., Anderl R., Gausemeier J., Schuh G., Wahlster, W. [24], Taran S., Yavorsky P., Pavitska Yu., Omelchenko I., Buchko M. [36], Kuznyetsova, A. Y., Zherybylo, I. V., Klipkova, O. I., & Kozmuk, N. I. [24]. The spread of the pandemic caused by COVID-19 has influenced the formation of financial reporting indicators of enterprises, which has been studied by such scientists as Boiko A., and Umantsiv Yu [38], Kuznyetsova A., Sydorchenko, T., Zadvorna, O., Nikonenko, U., Khalina, O. [21]. This impact has led to the expediency of clarifying methodological approaches to the valuation of intangible assets, which is devoted to the work of Ievdokymov V., Ostapchuk T., Lehenchuk S., Grytysyhen D., Marchuk G. [18], Kuzub, M., Zadniproviskyi, O., Romashko, O., Avhustova, O. [25; 26], Baker, C.R. and Persson, M.E. [3], Fomina O.V., Avhustova O.O., Shushakova I.K. [12]. The issue of valuation of intellectual property rights and digital assets is covered in the works of Visconti R. [1], Edi. E., Wati. E. [10], Jarrett J. [23]. Given the considerable scientific heritage, the development of methodological approaches to the valuation of intangible assets in business transactions, in the accounting and reporting system in the context of economic uncertainty and risks caused by COVID-19 and the Russian military invasion of Ukraine is particularly relevant for Ukraine.

In addition to the problems of intangible assets identification and initial recognition in accounting, the issues of disclosure of information about such assets in the financial statements are relevant, which in some cases requires determining their fair value and testing for changes in potential utility [38], especially given the consequences of the global COVID-19 pandemic and the military operations of the Russian Federation in Ukraine, which have had a significant negative impact on the economic activity of enterprises, disrupting the normal operation of enterprises and, in turn, affecting accounting estimates. This, in particular, applies to those intangible assets for which there is no useful life and no depreciation is charged (for example, the exclusive right to use a computer program, trademark, or know-how). The requirement and approaches to impairment testing are regulated by NAS 28 [28] and IAS 36 [16] with the same title "Impairment of Assets". According to these standards, enterprises should annually at the balance sheet date assess assets for changes in their potential usefulness, which is advisable to carry out during the annual inventory [28]. Compared to revaluation, impairment is the process of revaluation caused by a change in the fair value of the asset, and to reflect the process of impairment in the accounting system, it is necessary to make a number of economic calculations that have a fairly sound argumentation.

AIMS AND OBJECTIVES

The article aims at analysing the theoretical foundations and improving methodological approaches to the valuation of intangible assets and intellectual property in the process of commercialisation and in financial reporting in the context of economic instability.

METHODS

The methodological basis of the study, which is based on the principle of unity of theory and practice, consists of the synergy of quantitative and qualitative methods of data processing, empirical research methods (including observation, expert evaluation, and analysis of results), as well as theoretical methods of scientific research (including induction, deduction, analysis, synthesis, modelling, comparison and classification), which allows to systematically and comprehensively consider the issues of improving the methodology of valuation and testing for changes in the utility of intangible assets with the use of the methodology of the enterprise accounting system. The scientific research involves finding ways to improve approaches to valuation and testing for changes in the utility of intangible assets in the accounting system of the enterprise. The article is based on the theoretical basis, which is the fundamental information support for implementing scientific, theoretical, and practical principles of research.

RESULTS

The development of the global digital economy stimulates the demand for the involvement of intellectual property rights - patents, trademarks, industrial designs, copyright, and related rights - in business. In 2021, 24,468 applications were filed using the electronic filing system, including 1,099 (4.5% of all electronic applications) for inventions, 977 (4.0%) for utility models, 972 (4.0%) for industrial designs, and 21,420 (87.5%) for trademarks (Figure 1).

Ukraine's EU candidate status creates new challenges and opportunities for the development of the national science, technology, and innovation sector and its positive impact on Ukraine's post-war recovery. Cooperation with international companies is an important element of building digital resilience and shaping Ukraine as a digital state. Today, Ukraine is the best platform for testing the latest technologies in theory and practice. In 2022, SAP (System Analyse Programmentwicklung) provided Ukrainian customers with free software and cloud services worth more than EUR 30 million. In addition, SAP will provide about 1000 software licenses for the military needs of the Ministry of Defense of Ukraine [20].

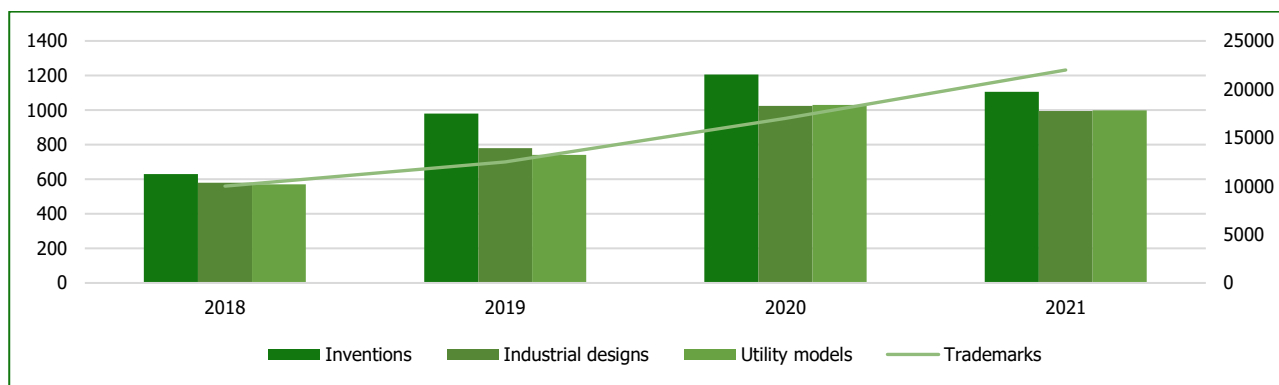


Figure 1. Dynamics of receipt of applications for registration of intellectual property rights through the electronic filing system in Ukraine. (Source: [2])

It should be noted that even before the Russian aggression, there was a significant level of technology transfer from the EU. In 2021, imports of royalties and other services related to the use of intellectual property from the EU amounted to USD 39,2879.5 thousand. Their exports, together with the IT sector, account for up to 40% of Ukraine's exports of services to the EU [13].

In 2021, European countries filed more than 1,000 applications for inventions and industrial designs for registration in Ukraine. The leaders in filing applications for inventions were applicants from Germany (215), Switzerland (212), the United Kingdom (172), France (65), Luxembourg (55), Belgium (53), Italy (45), the Netherlands (44), Sweden (34), and Denmark (32). Applications for trademarks under the national procedure were received from European countries up to 2000, among the member states of the Madrid system the most active applicants were from Germany (1,133 applications), France (520), Switzerland (460), Italy (458) [2].

These processes have led to the involvement of unique intellectual property rights objects in business processes, which are recognized in the accounting system as intangible assets. The study of the economic essence of intangible assets shows that among scientists' intangible assets are identified with such concepts as intellectual resources (assets), intellectual investments, knowledge capital, intangible capital, and intellectual capital [35]. Intellectual capital traditionally includes human capital (knowledge and skills of employees, innovative education), structural capital (copyrights, patents, internal databases, management processes), and consumer capital (brand, reputation, strategic relationships, contracts, markets) [21]. Research activities of higher education institutions produce such intellectual assets as research articles, books, book chapters, patents, utility models, and technological products, which allows expanding of the traditional structure of intellectual capital and adds competitive advantages to the company and scientific production with the number of authors [33]. Each of the listed assets has its own specific features and unique characteristics, however, the possibility of recognition on the balance sheet of the enterprise arises under the conditions of compliance with all the requirements provided by NAS 8 Intangible Assets (for those enterprises that prepare financial statements in accordance with national accounting standards) and IAS 38 Intangible Assets (for those enterprises that prepare financial statements in accordance with international standards). However, the problem is that most of the assets that are usually considered intellectual capital will not be recognized due to the lack of control over them, so the concept of "intellectual capital" is considered today through the prism of the concept of value creation in the short, medium and long term in the integrated reporting system. In this

regard, the research presented in the article will focus on the valuation of intangible assets, including through expert evaluation, specifically for the needs of accounting and disclosure in financial statements.

Accounting and expert evaluation of intangible assets.

The issue of valuation of intangible assets is relevant from the moment of creation of intangible assets to the moment of their disposal [12] (Fomina, Avhustova & Shushakova, 2021). IAS 38 Intangible Assets provides different approaches to the valuation of intangible assets depending on the nature of transactions with them (see Table 1).

Table 1. Approaches to the valuation of intangible assets under IFRS 38 "Intangible assets". (Source: [17])

No.	The cost that is estimated	Approaches to evaluation	The essence
1	Cost of production	Initial recognition of acquisition	The amount of cash or cash equivalents paid or the fair value of the consideration given to acquire them at the time of acquisition
2	Replacement cost	Initial recognition when registering previously unrecorded intellectual property objects	The amount of cash or cash equivalents that would be paid to acquire the same equivalent asset
3	Fair value	Revaluation, sale, lease, impairment testing	The amount at which an asset can be exchanged in a transaction between knowledgeable, willing and independent parties
4	Value of the asset in use	Impairment testing	The present value of future net cash inflows expected to be generated by the intangible asset when it is used

NAS 8 Intangible Assets emphasizes the priority of actual cost in the initial valuation of intangible assets of the enterprise in accordance with the financial concept of capital preservation.

However, the financial concept of capital allows in some cases the use of current value, provided that the historical cost remains the basic valuation [7].

An example of this may be the valuation of an intangible asset received free of charge. According to the norms of NAS 8, such an asset is credited to the enterprise's balance sheet at the fair (i.e. current) value, although in economic terms it will be historical (original) cost.

Domestic enterprises apply a mixed model of intangible assets valuation, which consists in the combination of several types of valuations (simultaneous use of financial and physical concepts), that is, it is allowed to use different valuations for a particular type of asset or for a particular situation. The same provisions are covered in the Conceptual Framework for Financial Reporting, which states that for different objects and different purposes, it is appropriate to apply different options and combinations of methods of value measurement. Section 6 of the Conceptual Framework for Financial Reporting provides such types of estimates as historical cost, fair value, present (current) value, and possible selling price (redemption value) [7]. It is worth noting that according to the amendments made to the Law of Ukraine "On Accounting and Financial Reporting in Ukraine", the principle of accounting for historical (actual) cost has been removed since 2018 [27]. At the same time, in accordance with the norms of NAS 8 and IFRS 38, paragraph 18 of Directive 2013/34/EU of the European Parliament and of the Council of 26.06.2013 in the financial statements, objects are evaluated on the basis of the acquisition price or production cost. Thus, to provide users with reliable information, it is allowed to revalue fixed assets, including intangible assets, which involves determining their fair value [8]. The definition of fair value (market) is found in various regulations on accounting and expert evaluation (see Table 2).

Table 2. Definition of fair value in regulatory documents. (Source: generalized by the authors according to [19; 29; 31])

Source	Interpretation
NAS 19 Business combinations	the amount at which an asset could be sold or a liability settled under normal circumstances on a particular date
IFRS 13 Fair value measurement	the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date
GAAP US	market value is the amount of cash or cash equivalents that could be received from the sale of assets in case of their liquidation
NVS 1 General principles of property and property rights valuation	the value for which it is possible to alienate the object of valuation in the market of similar property on the date of valuation under the agreement concluded between the buyer and the seller, after appropriate marketing, provided that each party acted with knowledge, reasonably and without coercion

According to paragraph 2 of IFRS 13 Fair Value Measurement [19], fair value is a valuation based on market inputs - it is measured using assumptions that market participants would use and reflects market conditions at the measurement date.

But for some assets, as noted earlier, there may be no observable market information or market transactions. Such assets include rights to certain intellectual property objects that are characterized by their uniqueness. In order to determine the fair value of such objects, it is envisaged to use an independent professional appraisal, including for accounting and disclosure purposes in financial statements. For example, when transferring intellectual property rights under license agreements, contributions to the authorized capital, impairment testing, etc.

The valuation is performed using a valuation base. International valuation standards define the following valuation bases: market value, market rent, fair value, investment value/cost, synergistic value, liquidation value, and fair value [22]. Expert valuation of intangible assets is carried out by professional appraisers, whose activities are regulated by the Law of Ukraine "On the valuation of property, property rights and professional valuation activities in Ukraine", International Valuation Standards [11], at the European level - European Business Valuation Standards 2020 (European Business Valuation Guidance Notes - EBVG 3 Valuation of Intangible Assets [11]., National Valuation Standards (NVS 4 Valuation of Intellectual Property Rights and NVS 1 General Principles of Property and Property Rights Valuation) [31,32]. In accordance with the norms of the above regulatory documents, there are three methodological approaches to determining the value of intangible assets, namely: comparative (market), income, and cost (see Table 3). The same approaches are provided for in IFRS 13 Fair Value Measurement.

Table 3. Approaches to the valuation of intangible assets by valuation standards. (Source: supplemented by the authors based on [9, 12, 32])

No.	Approach to the assessment	The essence	Objects of intellectual property to which it is possible to apply
1	Costly	Based on the determination of the cost of expenses necessary to reproduce or replace the object of valuation	Databases, scientific and technical information, distribution network, corporate practices and methods, the layout of integrated circuits, right to non-traditional intangible assets
2	Income	It is used to determine the valuation of intellectual property rights based on the application of valuation procedures for transferring expected income to the value of the object of valuation. This approach is used for accounting for income from the transfer of intellectual property rights (for example, under a sublicense or franchise)	Patent, license, invention, the appellation of origin, trade secret, computer programs, franchise rights, licensing agreements, personnel knowledge, copying rights, scientific discoveries, rationalization proposals, right to use natural resources, rights to use property, industrial property rights
3	Market (comparative)	It is applied if there is sufficient reliable information about prices in the market of similar objects and the terms of contracts for the disposal of property rights to such objects. That is, in order to reflect the fair value of IA in case of its revaluation, acquisition in exchange for a similar or dissimilar object, free of charge receipt, when contributing IA to the authorized capital, as well as when receiving IA as a result of a business combination	Trademarks and brands, and if there are analogues, are used to assess the value of property rights, the right to use property, the right to intellectual property (know-how, plant varieties, utility models, industrial designs, etc.), objects of copyright and related rights (the right to works and their performance, software, databases, etc.)

Each of these approaches to the valuation of intangible assets has certain peculiarities of use and methodological tools, in particular, it is usually impossible to use the comparative approach, in which the fair value of intangible assets is determined only if there is an active market (i.e. items sold and bought in this market are homogeneous, at any time it is possible to find interested sellers and buyers, information about prices is publicly available [30] since intangible assets are mostly unique and specific). The use of the income approach involves determining the discount rate and subsequent discounting of future cash flows from the use of intangible assets. Moreover, the determination of the present (discounted) value of cash flows is calculated both when alienating rights and when assessing the value of the asset in use (during the impairment testing procedure). Recall that the value in use of an asset is the discounted value of future cash flows to be derived from the use of that asset. The Organization for Economic Cooperation and Development's transfer pricing guidelines provide for the priority use of income approach valuation methods by calculating the discounted value of the estimated future cash flows derived from the use of the intangible asset being valued or from the transfer of rights to them.

The analysis of valuation standards shows that, in general, the approaches and methods for valuing intangible assets defined by NVS 4 are in line with international and European ones. However, unlike EBVG 3, which provides guidance on the valuation of both intellectual property rights and non-infringing rights, as well as goodwill in mergers and acquisitions, NVS 4 provides for the valuation of intellectual property rights only. Goodwill is not considered an intangible asset under accounting standards. Approaches to the valuation of other intangible assets and goodwill are regulated by accounting standards, in particular, if we talk about international financial reporting standards, these are IFRS 3 Business Combinations, IFRS 13 Fair Value Measurement, and IAS 38 Intangible Assets. In addition, these standards detail the tools for calculating the discount rate and describe the risks that may affect its value. In Ukraine, the appraiser has the right to independently determine the appropriateness of applying each of the methodological approaches to a particular valuation method. In this case, it is necessary to take into account the valuation basis, and the amount of information required to

apply a particular methodological approach and method. This means that in calculating certain indicators (discount rates, royalties), appraisers may be guided by international/European practice [39].

EBVGN 2 Discount Rates in the Discounted Cash Flow Technique states that the discount rate is one of the main inputs to the discounted cash flow (DCF) method and is used to discount projected cash flows to a present value at the measurement date. In the International Glossary, it is defined as "the rate of return used to convert a future cash amount into a present value" [11]. The discount rate reflects the risks associated with generating income from the use of the intangible asset.

There are different methods for determining the discount rate, such as the Capital Asset Pricing Model (CAPM), a Build-up method, a Dividend Growth Model, the Arbitrage Pricing Theory, etc. This Guidance Note provides commentary on the application of the CAPM method to estimate the market-based discount rate. This is the widely applied method in European business valuation practice and is also recognized by IFRS 13 Fair Value measurement" [11].

In accordance with CAPM, the basic formula for cost of equity calculation is the following:

$$E(R_i) = R_f + \beta \times ERP + \alpha \quad (1)$$

where: $E(R_i)$ – the cost of equity; R_f – risk-free rate; β – beta; ERP – equity risk premium (or market risk premium); α – alpha (specific risk)

The risk-free rate is defined as the rate of return available in the market on an investment free of default risk. As the risk-free rate R_f , the annual yield on 20-year long-term US Treasury bonds (US Treasury Bonds) is used, the value of which in 2022 was 3.31% [40]. The yield on the 20-year US Treasury bond is used in many theoretical studies to calculate the risk premium for investing in equity.

Beta is a function of the relationship between the return on individual security and the return on the market as measured by a broad market index ($\beta=1$ for investments with average returns, $\beta < 0$ for investments with lower returns, $\beta > 0$ for investments with higher returns).

The Equity Risk Premium — ERP (or Market Risk Premium) is recognized as a rate of return reflecting the additional risk of equity instruments. It may be based on the historical returns sometimes used to indicate a market expectation of future long-term returns [14].

$$ERP = E(R_m) - R_f \quad (2)$$

where: ERP – equity risk premium; $E(R_m)$ – historical return on a fully diversified portfolio of equity securities, each year from 1926-today [11]; R_f – the rate of return expected on a risk-free security, representing the historical income return on government bonds over a specific period. For example, it can be the actual historical yield on long-term government bonds – the geometric mean of the coupon yield on 10-year US Treasury bonds for the same period. According to the data published on A. Damodaran's personal website.

Specific risk (α) is related to the risk of investing in a particular enterprise with its specific operating conditions, in particular, it is a premium for small enterprises due to their insufficient financial stability. This premium is also required due to the lack of diversification for most investors in small closely held companies.

The determination of the discount rate becomes more complicated given the risks caused by the consequences of the COVID-19 pandemic and the military aggression of the Russian Federation on the territory of Ukraine, as the parameters used to estimate the discount rate becomes more unpredictable. This necessitates a thorough analysis of the following factors when determining the discount rate:

- current market conditions;
- market data for comparable intangible assets of entities that are comparable in value;
- risks of the asset or cash-generating unit to be measured.

It should be borne in mind that the increased risk associated with forecasts, given the increased uncertainty of beta for companies, as well as the determined cost of capital may increase.

When assessing the fair value of intangible assets today, the following key factors and risks should be taken into account, as shown in Table 4.

Table 4. Key factors and risks to consider when estimating the fair value of intangible assets in an environment of economic uncertainty. (Source: compiled by the authors based on [2])

No.	Factors and risks	Characteristics
1	The level of economic activity	A decline in economic activity (in production and demand for goods and services) may adversely affect the estimated future cash flows used in the discounted cash flow valuation technique
2	Credit and liquidity risk	The uncertain economic environment has increased credit and liquidity risk for many companies. As a result, the own credit risk and/or credit risk of counterparties used as inputs in valuation techniques may increase
3	Risk forecasting	Fair value estimates should reflect the greater uncertainty in economic and financial forecasts for the near term due to the difficulties in predicting the extent and duration of the impact of COVID-19 on the economy
4	Foreign currency risk	Companies that have significant sales or purchases in foreign currencies may be adversely affected by changes in foreign exchange rates
5	Commodity price risk	Companies operating in the extractive industries may be significantly affected by a decline in commodity prices. Companies in countries that are economically dependent on such commodities may also be at greater risk of adverse economic consequences

Significant judgment may be required to quantify risk premiums and other risk adjustments. In addition, there may be an increase in the number of fair value measurements categorized within Level 3 of the fair value hierarchy (e.g. due to unobservable inputs such as credit risk becoming significant in the current environment).

Also, when determining the fair value of intangible assets, it is appropriate to perform a fair value analysis or valuation:

- reflects assumptions made by market participants based on available information and market conditions at the measurement date;
- takes into account risk premiums that may arise as a result of increased uncertainty;
- whether the discount rates used in recent valuations have been updated to reflect the risk environment at the reporting date.

It is also advisable for management to consider the need to expand the disclosures about key assumptions, sensitivities and, key sources of estimation uncertainty. The company discloses such information in the Management Report.

The fact that effects of the COVID-19 pandemic and the military aggression of the Russian Federation on the territory of Ukraine have a long-term effect, and the cash flow projections should reflect explicit, clear, and reasonable assumptions about these effects based on the facts and circumstances at the end of the year, it is not appropriate to evaluate performance in comparison with the same period of the previous period.

Therefore, entities are encouraged to develop multiple probability scenarios for each to arrive at expected cash flows. Reporting entities applying a risk-based approach to estimating expected cash flows should pay more attention to negative scenarios to achieve the objective of incorporating the market's view of risk and uncertainty.

Estimation of expected cash flows is relevant when calculating asset impairment. IAS 36 Impairment of Assets seeks to ensure that assets are carried at no more than their recoverable amount. IAS 36 defines an asset's recoverable amount as the higher of a) its fair value less costs to sell; and b) its value in use. An asset's value in use is based on an estimate of the future cash flows that an entity expects to derive from the use of the asset or the present value of the cash-generating unit. As previously discussed, current uncertainties affect both fair value less costs of disposal and value in use. If the carrying amount of an asset exceeds its recoverable amount, the asset is impaired. IAS 36 then requires an entity to write the asset down to its recoverable amount and recognize an impairment loss. In addition, it is necessary to annually test the impairment of intangible assets with indefinite useful lives (and any intangible assets that are not yet ready for their intended use) and goodwill, for other classes of assets within the scope of the standard, an entity is required to test the asset for impairment whenever there is an indication of impairment [16]. Determining the criteria for testing for changes in potential utility is very important for such specific assets as intellectual property. Since the results of testing for the usefulness of intellectual property have a significant impact on the financial statements of the enterprise, the criteria by which it was carried out should be established by the Order of the accounting policy of the enterprise in the context of each intangible asset. According to NAS 28, testing for changes in potential utility is carried out in the following cases, as shown in Figure 2.

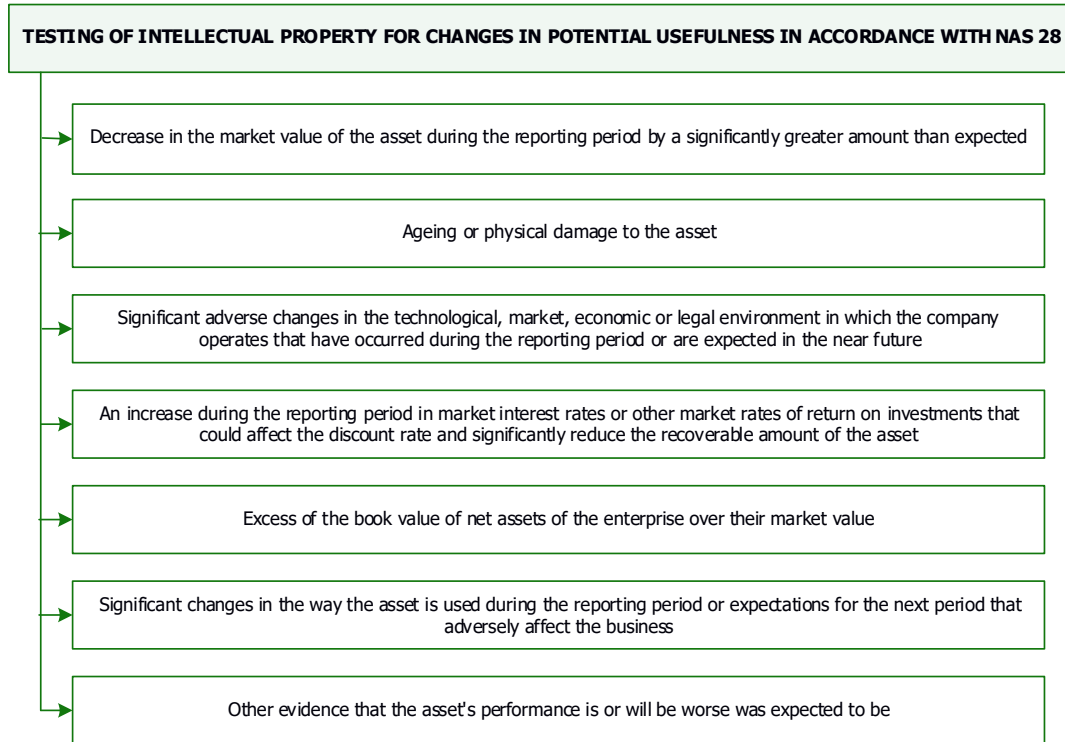


Figure 2. Indicators of intellectual property testing for changes in potential utility in accordance with NAS 28. (Source: compiled by the authors based on [28])

At the same time, IAS 36 Impairment of Assets divides the obtained indicators into internal and external, which are obtained respectively from internal and external sources of information (Table 5). As stated in IAS 26 and practice shows, this list of indicators of impairment of assets is not exhaustive. Taking into account the impact of external and internal factors on the fair value of intangible assets caused by the COVID-19 pandemic and the consequences of the military aggression of the Russian Federation on the territory of Ukraine, there is a need to improve methodological approaches to valuation and impairment testing of intangible assets, which will ensure the reflection of true and fair information about the value of intangible assets in the financial statements.

Table 5. Indicators of impairment of assets under IAS 36. (Source: compiled by the authors based on [16])

External sources of information	Internal sources of information
<ul style="list-style-type: none"> ▪ during the period, the market value of the asset has decreased significantly more than it would be expected to decrease as a result of the passage of time or normal use; ▪ a significant adverse change has occurred during the period, or is likely to occur in the near future, in the technological, market, economic, or legal environment in which the entity operates or in the market for which the asset is intended; ▪ market interest rates or other market rates of return on investments have increased during the period and the increase is likely to affect the discount rate used in calculating the asset's value in use and significantly reduce the asset's recoverable amount; ▪ the carrying amount of the reporting entity's net assets is greater than its market capitalization. 	<ul style="list-style-type: none"> ▪ there is evidence of obsolescence or physical deterioration of the asset; ▪ a significant change that has occurred during the period that adversely affects the entity, or is expected to occur in the foreseeable future, that will change the intensity or manner of the current or planned use of the asset. These changes include plans to cease the use of the asset, to discontinue or restructure the business unit to which the asset belongs, to dispose of the asset sooner than previously expected, and to reassess the useful life of the asset, this time as determined; ▪ the asset's performance is or will be worse than expected; For an investment in a subsidiary, jointly controlled entity or associate, the investor recognizes dividends from its investment and there is evidence that: ▪ the carrying amount of the investment in the separate financial statements exceeds the carrying amount of the investee's net assets, including associated goodwill, in the consolidated financial statements; or ▪ the amount of the dividend exceeds the total profit of the subsidiary, jointly controlled entity or associate for the period for which the dividend is declared.

Typically, companies start by estimating the value in use. This is because if the value in use exceeds the carrying amount, there is no need to determine fair value less costs to sell, and vice versa. However, if the value in use indicates an impairment loss, then the fair value fewer costs of disposal should also be estimated unless facts and circumstances

indicate that the fair value fewer costs of disposal will not be materially higher than the value in use or cannot be reliably estimated.

The main components of a value-in-use estimate are estimated cash flows, a risk-free discount rate and adjustments to take account of variability, uncertainty and other factors that market participants would reflect in pricing the asset or cash-generating unit. IAS 36 allows these adjustments to be reflected in one of two ways: by adjusting the discount rate or by adjusting cash flows (including long-term growth assumptions).

Taking into account the uncertainty of the economic situation in the country and the world, the use of a risk-based approach to the discount rate, which is commonly used in impairment testing of intangible assets, is not sufficiently effective. For this reason, it is more appropriate to use a risk-adjusted expected cash flow approach, as this approach provides a more explicit consideration of a wider range of possible future outcomes than the normal one. In doing so, management should ensure that the risks, uncertainties and other factors that will influence market participants' pricing decisions are reflected. It is equally important to ensure that the concepts of cash flows and discount rates are aligned to avoid double accounting for the risks of COVID-19 and military aggression of the Russian Federation on the territory of Ukraine.

According to accounting standards, when testing assets for impairment, the recoverable amount of an asset should be estimated as the higher of its net realizable value or the present value of future net cash flows from the asset (Figure 3).

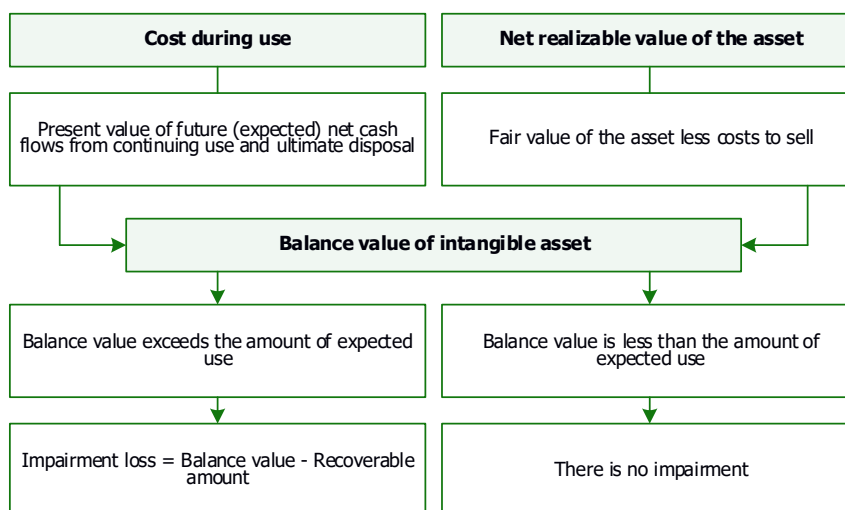


Figure 3. Algorithm for testing an intellectual property object for changes in potential utility. (Source: compiled by the authors based on [28])

For a more visual expression of the change in the potential utility of intangible assets in monetary terms, it is proposed to use the coefficient of change in potential utility, which should be calculated by the formula:

$$Ccpu = \frac{FV(Vu)}{Bv}, \quad (3)$$

where: *Ccpu* – coefficient of change in potential utility; *FV* – fair value of the item calculated taking into account uncertainty, fewer costs to sell; *Vu* – value in use – the discounted value of future cash flows to be derived from the use of the asset; *BV* – book (residual) value of the intellectual property objects.

If the coefficient of change in potential utility is greater than 1 - there is no impairment of intangible assets. If the coefficient of change in potential utility is below 1, it is necessary to calculate the new value taking into account the impairment.

Reflection of changes in potential utility in the accounting system of the enterprise, taking into account the above indicators and the coefficient of change in potential utility, is carried out as follows: the difference between the residual value and the value of the intangible asset after testing for changes in potential usefulness is recognized as other expenses of the reporting period with a simultaneous increase in the amount of amortization of the intangible asset (if $Kpc < 1$).

The use of the proposed will ensure compliance with the principle of relevant coverage of information about the value of the object and the enterprise as a whole.

DISCUSSION

One of the trendy areas of scientific discourse in recent years is the study of factors that affect the ability of companies to create value in the long term. In this context, special attention is paid to the valuation of intellectual capital components, in particular, intellectual property and other intangible assets (Buzinskiene, R., Rudyte, D. [6], Dyba V. [9], Ievdokymov V., Ostapchuk T., Lehenchuk S., Grytsyshen D., Marchuk G. [18], Roberto Moro-Visconti [34], Quintero-Quintero W., Blanco-Ariza A., Garzón-Castrillón M. [33], etc.

Based on the studies of domestic scholars on a comparative analysis of national and international standards for the valuation of intangible assets and changes in their usefulness in the context of Ukraine's European integration (Fomina O., Avhustova O. [12], Umantsiv, G., Shushakova, I., & Levchenko, Yu. [39], etc.), it can be argued that at the national level, the methodological methods for testing assets for changes in potential utility are not sufficiently detailed. This necessitates the improvement of fair value measurement tools, in particular in the context of impairment testing of intangible assets, which will ensure that the financial statements reflect relevant information about the value of assets, and thus the value of the enterprise and its ability to grow in the future.

In this article, we raise the issue of enhancing the relevance and improving methodological approaches to determining the fair value of intangible assets in connection with the acute problem of post-war reconstruction, including through technology transfer and the involvement of intellectual property rights (software, technologies in the field of health, environment, security, and defence) in the practice of business (Angela Kuznyetsova, Iryna Boiarko, Myroslava Khutorna, and Yuliia Zhezherun [6]). In the post-pandemic environment and military aggression in Ukraine, there is a need to take into account a number of factors in the valuation of such specific assets that have caused uncertainty in forecasting future cash flows from the use of intangible assets, the need to identify risks associated with current challenges that affect their valuation.

CONCLUSIONS

The choice of the type of value in the valuation of intangible assets depends on the purpose for which they are valued. In the process of crediting intellectual property rights to the company's balance sheet, their value is reflected in accordance with the financial concept of capital, which allows for compliance with the requirements of paragraph 10 of NAS 8 regarding the priority of the purchase price or production cost of intangible assets at their initial recognition and crediting to the balance sheet. In the process of using intellectual property, it is advisable to recognize them at their current value, which can be determined by the results of their revaluation. However, the revaluation process is permissible only for those intellectual property items for which the useful life has been determined and amortization is being charged. Otherwise, they should be tested for changes in potential usefulness. In the process of commercialization of intellectual property rights, they should be measured at fair value, which reflects their market value, thus forming a competitive value of the objects in the market. Given that the fair value measurement of intangible assets is based on the determination of the present value of the projected cash flows from their use and, accordingly, the calculation of the discount rate, it is necessary to take into account the conditions of uncertainty and other factors that affect the measurement. Currently, there are also the consequences of the COVID-19 pandemic and military operations in Ukraine. IAS 36 allows for adjustments to the discount rate or adjustments to cash flows (including long-term growth assumptions).

The need to clarify the list of criteria for impairment/recovery of intangible assets is due to the general nature of the test indicators defined in NAS 28 Impairment of Assets. In view of this, the methodological approach to testing intangible assets with an indefinite useful life as part of intangible assets has been improved in terms of supplementing the indicators of loss/recovery of intellectual property with external and internal criteria. Prospects for further research include the identification of risks caused by global economic instability, as well as their impact on the fair value of intangible assets.

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ОЦІНКА НЕМАТЕРІАЛЬНИХ АКТИВІВ В УМОВАХ ЕКОНОМІЧНОЇ НЕСТАБІЛЬНОСТІ В УКРАЇНІ

Стаття присвячена питанням оцінки нематеріальних активів, зумовленим глобалізаційними процесами, глибинною цифровою трансформацією економічних відносин і, як наслідок, упровадженням результатів інноваційно-інтелектуальної діяльності в усі сфери господарської діяльності. Сучасними реаліями України є розробка й використання інноваційного софту у воєнних діях ((штучний інтелект, автономні системи (безпілотні літальні апарати), програмне забезпечення (автоматизовані системи управління боєм, системи ситуаційної поінформованості, цифрові карти та ін.)), у сфері безпеки й оборони, екології, охорони здоров'я та реабілітації військових і мирного населення, відновлення енергетичної й транспортної інфраструктури тощо. Усі ці процеси пов'язані з генерацією інтелектуальних продуктів і прав інтелектуальної власності, які за економічною сутністю є нематеріальними активами й не можуть бути комерціалізовані без їх оцінювання.

Метою дослідження є аналіз міжнародного досвіду та національної практики оцінки нематеріальних активів і прав інтелектуальної власності в процесі їх комерціалізації, а також у системі обліку й звітності за умов економічної нестабільності. Висвітлено проблеми оцінювання та розкриття інформації про нематеріальні активи у фінансовій звітності, зокрема щодо необхідності їх тестування на предмет зміни потенційної корисності, урахуваючи наслідки глобальної пандемії COVID-19 та російського воєнного вторгнення в Україну, які спричинили знецінення активів, зростання ризиків та їхній вплив на облікові оцінки й розкриття.

Основними результатами дослідження є вдосконалення методичних підходів до оцінки нематеріальних активів з урахуванням ризиків, пов'язаних із наслідками пандемії COVID-19, воєнної агресії росії проти України та глобальною економічною невизначеністю, що надзвичайно ускладнює прогнозування майбутніх грошових потоків і потребує ідентифікації таких ризиків, які впливають на оцінку.

Ключові слова: інноваційна діяльність, нематеріальні активи, права інтелектуальної власності, справедлива вартість, оцінка, економічна невизначеність, зменшення корисності активів

JEL Класифікація: E22, M41, G12