Sustainability of registration and disclosure of intellectual property information

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Abstract. The article is focused on the review of the system of registration and disclosure of intellectual property. The paper is based on the current state of knowledge of theory and practice in the field. The author performed the collection and content analysis of existing data. The author also supplemented the analysis from the knowledge of already existing data of other authors. He also collected his own data, which complements the unanswered questions of the content analysis of intellectual property records. What are the key findings? The literature states that industry is a key determinant in publishing intellectual property in annual reports. In addition, the size of the intellect is another determining factor in the intellectual disclosure of information. Another determinant is the issue of voluntary disclosure. Content analysis may not always give a true picture. Procedures and the obligation to publish information on intellectual property are regulated in different countries by various binding standards. In the analysis, we used data from several countries around the world, which are required to apply various binding procedures, standards. Despite these limitations, this analysis shifts the level of knowledge in the field of registration and disclosure of intellectual property. Thus, we can state with regard to the state of valuation and registration of intellectual property that registration of intellectual property is not always a picture of the fact that it is a problem to value intellectual property and introduce into records that the risk of subjectivity of valuation of individual components of intellectual property needs to be verified by the market For some components of intellectual property and respect for the precautionary principle in accounting, it is impracticable to verify valuation by the market, that companies do not pay sufficient attention to intellectual property, its valuation, valuation updating, registration, and subsequently administration and protection.

1 Introduction

We must consider globalization as the most important process that irreversibly affects the development of the world economy. Globalization creates a new market environment with new opportunities and risks for individual economies. Above all, if countries want to mitigate the effects of a pandemic crisis, they must restore consumption and demand. [1] This task is not easy. For several years now, we have been able to observe the irreversible development of significant changes in the field of digitization, e-commerce, robotics and others. The traditional economy is pushed out by the virtual / digital / economy, the shared economy. We are witnessing the forced restructuring of economies in order to ensure competitiveness. The level of digitization has only been measured for a few years. Logically, the question arises as to whether the registration tools used are of sufficient quality, functional for effective decision-making by managers. To what extent are the recorded results reliable. The aim of this paper is to analyse the perception of the scope of intellectual property records in relation to the increase in research and development costs, and the generation of GDP, trademark patents, know-how, the share of intangible assets and copyright. We obtained research data online. We statistically processed the respondents' statement on the perception of the reality and completeness of the records of intangible assets.

2 Current state of the solved problem at home and abroad

Literature review More than ever in history, intangible assets are considered to be the primary driver of economic growth and value today. Leonard Nakamura [15] estimates that the total investment in intangible assets in the 1990s was nearly $ 1 trillion and the total capitalized value of intangible assets was $ 6 trillion. Hall [6] estimates that the share of intangible assets ranges from 50% to 75% of the total market value of publicly traded companies. Total investment in intangible assets was nearly $ 1.2 trillion [13]. Andrew Sherman [20] estimated investments from $ 10 trillion to $ 30 trillion. These facts indicate difficulties in valuing intangible assets. According to Damodaran [3] [4] and Lev and Aboody [12], it is recognized that intangible assets are capable of achieving higher returns than tangible assets. As a result, investments in intangible assets outweigh investments in tangible assets, especially people. At any time in history, intangible assets have been considered primary, the driving force of economic growth and value even today. Leonard Nakamura [17] of the Federal Reserve Bank of Philadelphia estimates that the total investment in intangible assets in the 1990s was nearly $ 1 trillion. Accounting was again a challenge due to its inability to adapt to the modern age. Gradually disappeared calls for changes in accounting standards. With the growing realization of what important intangible assets can be omitted from the records. The importance of intangible assets is described by Baruch Lev[10], [14] emphasizing the value of intangible assets that create value. [16], [18] Accounting is not able to identify and measure intangible assets. Ownership rights and ownership of intangible assets are still very foggy, which poses a great risk to managers and investors. [8], [9], [11] Accountants have yet to

find a reasonable method of quantifying the fair value of an intangible asset. This limits progress on intellectual capital. Not all R&D The company's efforts are successful and companies must clearly state the uncertainties surrounding these expenses. For example, in 2011, Nokia spent $ 7.8 billion in R&D, representing 14.5% of its revenue [7]. Investors need to be aware that a significant proportion of investments made in this area will not be successful. Information sharing is practiced by pharmaceutical and biotechnology companies. The fact in the industry shows that the disclosure of such information will not pose a risk of misuse of confidential information for companies. [5] further emphasizes that managers are not able to identify intangible assets. Grameenphone, the largest communications operator in Bangladesh, has the largest intangible assets in companies listed on the Dhaka Stock Exchange; which is almost 30% of its assets, and all of them are buying intangible assets in the form of business management software and networks Internally, intangible assets have created a larger share of intangible assets. [19] we focus on the value of intangible assets in companies forming the DS30 index. The authors examine whether they are accounting, management procedures are recorded in the records. Recognition of intangible assets is crucial for improving the quality and reliability of accounting. They also examined the inconsistencies that exist between the recognition and measurement of internally generated and purchased intangible assets. [21] The first problem with intangible assets begins with their identification. Another problem is the identification of owners and temporary users of rights.

3   Methodology and research methods

The main goal of this paper is to analyze the perception of the scope of intellectual property records in relation to the increase in research and development costs, and the generation of GDP, patents, trademarks, know-how, the share of intangible assets and copyright. We obtained research data online. We statistically processed the respondents' statement on the perception of the reality and completeness of the records of intangible assets. We took over data on the development of GDP, science and research from the databases of the National Bank of the Slovak Republic and the Statistical Office. We investigated the dependences of the above parameters on the development of the level of registration. Our research question is to confirm or not confirm the correlation. We have used recognized, general scientific methods to achieve our goals. Empirical methods, in particular observation methods and controlled interviews, were used in the study of the literature to obtain information. The information is accompanied by the observation of phenomena from different angles. In this context, it used the comparison method. In processing the information obtained, a systemic approach was applied as a general research methodology and allows the spread of the phenomenon of partial problems without disrupting the overall context and links. This approach allows a comprehensive study of selected objects. In addition to the alleged methods, generally accepted methods of scientific research were used, in particular the basic and most frequently used methodologies, such as analysis and synthesis. The analysis was used to determine the links between the parts of the whole, their complementarity and impact. Synthesis that compared with the analysis of the reverse phenomenon. This allowed us to formulate generalizations.

4   Results and discussion

The registration of intangible assets in Slovakia is based on valid legislation and internal binding standards in this area. We must also take into account the specific fact that intellectual property is not always the property of the company, but also, and in particular, the personal and property rights of a particular entity (originator or owner). This content can also be found in the definition of a company regulated in the introductory provisions of the Commercial Code. So where can we look for intellectual property information? One of the sources of information is accounting records, which business entities implement to the extent specified by law. The internal directive can adjust the operational records to meet the specific requirements of a particular entity for the field of intellectual property. We divided the sources of information on intellectual property into several blocks. In block A. in terms of the accounting structure of intangible assets [2] we find intellectual property (its individual components) in the records of the input price of long-term intangible assets:, especially costs related to acquisition of long-term intangible assets, - intangible assets created by own research and development, if it is possible to demonstrate the possibility of its technical completion, future use. It is the design of new or significantly improved materials, equipment, products, processes, systems or services. Results of development work performed, purchased separately, which are not part of the supply of other intangible fixed assets. - software, whether or not it is the subject of copyright, if purchased separately and not part of the supply of hardware and its valuation, self-created for the purpose of trading and using it for the purposes of the entity, unless custom software or as part of a hardware supply. - valuable rights are know-how, licenses, usage rights, publishing rights, publishing titles, copyrights, import and export quotas, trademarks, trade marks, recipes, industrial property rights and other intellectual creativity, if procured for consideration. Block B. takes into account adjustments to the valuation of intangible assets / depreciation, adjustments to the valuation of intangible assets. Non-negligible information leading to the realization of the valuation of registered intellectual property includes depreciation, provisions, reserves ...,

which we use to correct the valuation of assets in the records: depreciation of the relevant component of intangible assets should reflect the process of depreciation throughout its use; the provision in accordance with the precautionary principle should reflect a reasonable presumption that an impairment loss has occurred.

Table 1. Descriptive statistics

	HDP	VaV_pr	PAT	OZ
Mean	81,993712	0,689084	0,399889	1,442222
Standard Error	2,326924	0,005982	0,020070	0,071604
Median	81,038266	0,687507	0,393000	1,430000
Standard Deviation	6,980772	0,017945	0,060209	0,214813
Sample Variance	48,731182	0,000322	0,003625	0,046144
Kurtosis	-0,600343	-0,859770	0,898190	-1,273415
Skewness	0,482423	0,301288	-0,991068	-0,297470
Range	20,687420	0,052726	0,187000	0,550000
Minimum	73,483822	0,666108	0,277000	1,140000
Maximum	94,171242	0,718833	0,464000	1,690000
Sum	737,943407	6,201752	3,599000	12,980000
Count	9,000000	9,000000	9,000000	9,000000
Largest(1)	94,171242	0,718833	0,464000	1,690000
Smallest(1)	73,483822	0,666108	0,277000	1,140000
	COP	KNW	TAN_ass	INT_ass
Mean	1,355000	0,730556	0,041800	0,032478
Standard Error	0,197722	0,041197	0,001872	0,001910
Median	1,254000	0,720000	0,040700	0,032700
Standard Deviation	0,593166	0,123591	0,005616	0,005731
Sample Variance	0,351846	0,015275	0,000032	0,000033
Kurtosis	0,438777	-0,913432	2,654355	1,429104
Skewness	0,835293	0,228148	1,602342	0,346793
Range	1,835000	0,367000	0,018200	0,020700
Minimum	0,692000	0,565000	0,036100	0,022800
Maximum	2,527000	0,932000	0,054300	0,043500
Sum	12,195000	6,575000	0,376200	0,292300
Count	9,000000	9,000000	9,000000	9,000000
Largest(1)	2,527000	0,932000	0,054300	0,043500
Smallest(1)	0,692000	0,565000	0,036100	0,022800

Source: Own processing

Note: HDP - gross domestic product, VaV_pr - increase in research and development costs, PAT - v perception of patents, OZ - perception of trademarks, COP -c opyright, KNW - Know How, TAN_ass - tangible fixed assets, INT_ass - share of intangible assets in assets.

Block C is divided into internal and external entities. Identification of intellectual property in business records is very difficult. However, in block C. The intellectual property of the "enterprise" must also be found in the "non-property components of the business". In terms of accounting, we mean in particular the "originators". The transfer of property rights to the intellectual property of the originators creates authorized persons who are authorized to dispose of the intellectual property to the permitted extent.

Such entities may be active in relation to the undertaking concerned (C1, C2). Such facts are also shown by the company's accounting records. However, little can we identify the share of the value of intellectual property in their record valuation. The source of

information on the company's intellectual property is also various internal and external analyzes, statistics and databases, which the entity implements even if they do not result from the legal registration obligation. It may be a request of others, especially foreign entities due to their majority property connection. These entities require regular information in the structure of their registration system, which is quite different. It is clear from the above that in the structure of accounting records there is sufficient space for the registration of individual components of intellectual property that the company uses in business. Why, then, do we not find in the company records a complete and realistic representation of the individual components of intellectual property, despite the fact that, in the opinion of experts, their value represents a significant proportion. In the literature, we have focused mainly on analyzes of intellectual property records with a focus on business performance. Our analysis of intellectual property records in relation to the increase in research and development costs, and the generation of GDP, patents, trademarks, know-how, the share of intangible assets and copyright. We statistically processed the collected data and present them in tables.

Table 2. Anova of selected indicators

Source of Variation	SS	df	MS	F	P-value	F crit
Rows	50,7041	8	6,3380	1,1844	0,3224	2,0868
Columns	53 033,5047	8	6 629,1881	1 238,7974	0,0000	2,0868
Error	342,4838	64	5,3513			
Total	53 426,6926	80				

Source: Own processing

The analysis of the correlation confirms the dependence of the development of elasticity of research and development and the development of GDP. The development of copyright confirms the dependence on the elasticity of research and development and the development of GDP, the perception of patents and, in part, trademarks.

Table 3. Corelation of selected indicators

	HDP	VaV_pr	PAT	OZ	COP	KNW	TAN_ass	INT_ass
HDP	1							
VaV_pr	0,99863	1						
PAT	0,0414	0,03973	1					
OZ	0,14563	0,13474	-0,2115	1				
COP	0,73565	0,75476	-0,4028	0,3533	1			
KNW	0,55421	0,55841	-0,5787	-0,0335	0,70884	1		
TAN_ass	-0,2452	-0,242	-0,8121	0,22786	0,31566	0,42156	1	
INT_ass	0,25772	0,27173	-0,7603	0,05193	0,60337	0,79282	0,67314	1

Source: Own processing

Note: HDP - gross domestic product, VaV_pr - increase in research and development costs, PAT - v perception of patents, OZ - perception of trademarks, COP -c opyright, KNW - Know How, TAN_ass - tangible fixed assets, INT_ass - share of intangible assets in assets.

The level of Know How depends on research and development and changes in GDP, perception of copyright and perception of the level of Patents. The development of tangible assets confirms the dependence on the perception of patents and copyrights. The development of the share of intangible assets confirms the dependence on the perception of patents and copyrights, on the perception of Know How and on the perception of tangible assets. Statistics suggest that we have many reasons to make adjustments to the intangible assets register.

5   Conclusion

We can therefore state with regard to the state of valuation and registration of intellectual property that registration of intellectual property is not always a picture of the fact that it is a problem to value intellectual property and introduce into records that the risk of subjectivity For some components of intellectual property and respect for the precautionary principle in accounting, it is impracticable to verify valuation by the market, that companies do not pay sufficient attention to intellectual property, its valuation, valuation updating, registration, and subsequently administration and protection. The course of digitization is associated with increased creation and increased use of intellectual property. In this context, we recently conducted research on 288 companies in the field of perception, registration and management of intellectual property. Business research activities can only be partially identified in business records. Purchased results of external research activities are problematic to identify in the costs of companies. Generally accepted scientific research methods have been used, in particular the basic and most widespread methodological procedures, such as analysis and synthesis, deduction and induction. The research also used the method of purposeful analysis - a questionnaire survey, which was focused on a selected sample of Slovak companies. The data were obtained from our own survey of respondents representing selected companies doing business in the Slovak Republic. In the questionnaire, we formulated several questions to obtain evidence to achieve the research goal. The owners took over the research share 10% and the managers took over 15%. The owners do not consider the share estimate to be significant and the managers believe that the research evidence is 5% lower. They therefore declare the discrepancy of the evidence with reality. The average value of the scope of research activities is $M = 7,492$; standard deviation $SD = 10.9$. Minimum value $Min = 0$, maximum $Max = 50$. The scale was filled in by 238 respondents. We also examined the correlation of selected parameters in order to identify the correct parameters (indicators) to measure the effects of the research results. We found a correlation between research spending, employment, turnover, wages and bonuses. Subsequently, we conducted an examination of the sustainability of measuring the level of digitization in relation to competitiveness, research and development costs, GDP generation and Internet connection. We obtained research data online. We statistically processed the respondents' statements. The correlation analysis confirms the dependence of the development of elasticity of research and development and the development of GDP. The development of copyright confirms the dependence on the elasticity of research and development and the development of GDP, the perception of patents and partly also trademarks. The development of tangible assets confirms the dependence on the perception of patents and copyrights. The development of the share of intangible assets confirms the dependence on the perception of patents and copyrights, on the perception of Know How and on the perception of tangible assets. In the development of digitization, this situation takes little account of the risks that the current reality brings us.

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