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CENTRAL EUROPEAN REVIEW OF ECONOMICS & FINANCE Vol. 40. No 5 (2022) pp. 5-22 DOI https://doi.org/10.24136/ceref.2022.017

Katarzyna Brożek^{*}

ATTRIBUTES OF HUMAN CAPITAL IN THE CONTEXT OF INNOVATION OF THE VISEGRAD GROUP

Abstract:

The aim of the article was to identify and quantify the impact of human potential on the level of innovation of the Visegrad Group (V4) countries. In the theoretical part of the considerations, a critical analysis of the literature on the subject and a library query were used, while in the empirical part a statistical analysis was applied, which included the characteristics of a sample of selected features, an analysis of a series of correlations examining the matching of features, and an analysis of the results obtained. The collected data was compiled using descriptive statistics - average values, dynamics of changes, and Pearson's correlation coefficient. In the course of the analysis, it was possible to identify several dependencies with a fairly strong or moderate strength of the relationship. The main conclusions include the fact that there is a fairly strong positive correlation between human resources in science and technology and expenditure on research and development in the enterprise sector. The practical implication of the study may be the fact of diagnosing the main attributes of human capital which, in turn, may be interpreted as outlining a certain field for the application of a targeted policy aimed at increasing the innovativeness of the Visegrad Group.

Keywords: innovation, human capital, Visegrad Group countries

JEL Classification: 015, 032, 057

Paper type: Theoretical research article

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Introduction

Innovation is a term that has become more and more common in recent decades. Thanks to innovations, to a large extent, civilization development is possible. Their strength was particularly visible in the era of industrialism and in the time of digital revolution. However, to generate innovations, appropriate intellectual capital is obligatory. It is thanks to it that the efficiency of the organization increases through the experience, knowledge, skills of employees, as well as the determination of new methods of task implementation. Therefore, intellectual capital illustrates the value of ideas and the ability to be innovative in the long term. In view of the above, the aim of the article was defined as identifying and quantifying the impact of human potential on the level of innovation of the Visegrad Group countries. Two research questions were defined:

- 1. Do all the studied relationships show a linear relationship?
- 2. Which of the tested pairs of measures are characterized by the greatest strength of association?

In the theoretical analysis, a critical analysis of the literature on the subject was used, while in the empirical research, statistical analysis was applied. The data was taken from public statistics. The research period was set for the years 2012-2021. Nevertheless, in the course of the analysis, the research period had to be slightly modified due to limitations in access to full and complete data.

1. Theoretical considerations on the impact of human capital on innovation

Human capital stimulates innovation because it is not only a source of new ideas and methods of applying knowledge in an organization (Beck-Krala, Duda, 2014, pp. 13-19), but also it supports the creation of organizational knowledge, and helps to share knowledge in both hidden and open way. High qualifications of employees translate into innovation processes, as well as the processes of creating and transferring knowledge and technology (Tuziak, 2017, p. 112). It is also emphasized that innovation depends on certain factors, such as having appropriate professional competences; attitudes (more in: predispositions Mudannayake, 2021, 36-45); pp. and intellectual efficiency; good relations in the personnel; appropriate organizational technology; the ability to bring and retaining the best specialists; etc. These assets are commonly

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referred to as intellectual capital, where human capital (Bontis, 1998, pp. 63-76) is incorporated.

Considering the enterprises from the perspective of resources, it can be stated that they have diverse resource capabilities, and that their competitive advantage results from their availability. Innovation can be seen as a process that enables the accumulation of knowledge and technological capabilities to improve productivity while reducing costs and prices (Mariz-Perez, Teijeiro-Alvarez, Garcia-Alvarez, 2012, pp. 68-76). As noted by Wolak-Tuzimek & Duda (2007, p. 45), the use of innovation means better economic results and an increase in the competitiveness of the company; the consequence of such a situation is the chance to gain a significant position on the domestic or international market. In order for enterprises to be innovative, they need knowledge resources that are the foundation for creating concepts and ideas turned into modern products (Faroog, 2018, pp. 139-160). If such resources are lacking inside the company, they should be sought outside of other market players and organizations. Such a solution, combined with the available resources, can increase the innovation potential (Chesbrough, Bogers, 2014, p. 3-28). Stawasz (2014, p. 97) stated that the best method of turning innovation into a competitive advantage is to create innovative capacity understood as an indicator of innovation success. On the other hand, Maksymenko & Komandrovska (2021, pp. 19-33) suggested that achieving high competitiveness and ensuring a decent standard of living is possible only if a flexible strategy for the development of intellectual innovations and an effective mechanism for its implementation are developed.

It should be remembered that the development and competitiveness of an organization are influenced by human resources, which are an important element of the knowledgebased economy. In turn, Pacud (2019, pp. 154-166) notes that the ongoing changes, such as the reform of education, Poland's integration with the European Union, demographic decline or growing competition, have significantly affected the functioning of schools. In the era of the developing information society and the resulting need for lifelong learning, the need to constantly verify the level of competence of both educated and educating people is of particular importance (Dzhuguryan, Iwan, & Marchuk, 2019, pp. 38-49). In addition, Olszewska (2020, pp. 48-63) explains that along with technological development and the creation of a knowledge-based network society, the role and scale of using e-learning in modern education is changing.

Innovation can be achieved with the help of R&D activities and human capital. Through innovation, new services and products are provided, while the increase in human capital improves the abilities and skills of employees, which determine R&D activities. Therefore, it can be said that research and development is driven by the growth of human capital. As noticed by Morawski & Kobyłko (2006, p. 201), R&D activities led to an increase in a specific knowledge base and its implementation in innovative applications. It should be remembered that research and development also generate new knowledge, and this translates into new products. In the innovation process, knowledge consists of a distinct set of knowledge acquired internally by the firm through R&D and external knowledge acquired from external sources of information such as customers, competitors, suppliers, and other organizations, and through absorbent capabilities that the firm has internalized and made available for innovation (Criscuolo, Laursen et al., 2018, pp. 115-143).

2. Research methodologies

The aim of the article was to identify and quantify the impact of human potential on the level of innovation of the Visegrad Group countries. To develop the theoretical part, a critical analysis of literature and a library query were used, while in the empirical part, one research method was used - statistical analysis, which included the following elements:

- characteristics of the sample of selected features,
- analysis of a series of correlations examining the matching of features,
- analysis of the obtained results

Public statistics were used as the source of empirical data. The data was obtained from the European Statistical Office "Eurostat". The collected data was compiled using descriptive statistics. For this purpose, the change in relation to the base year (dynamics) as well as the median, first and third quartiles were calculated. In addition, the relationship between the selected measures was examined using the Pearson correlation. The following indicators were used in the analysis of the relationship between human capital and innovation:

- ratio of the number of students to the number of academic staff;
- public spending on higher education;
- human resources in science and technology (HRST) aged 25-64;
- expenditure in the enterprise sector on research and development;
- notifications to the EPO.

The obtained dependencies can be interpreted as strong/moderate/weak. However, such an interpretation is arbitrary. It was assumed that the correlation strength should be interpreted as follows: |r|<0.2 - no linear relationship; $0.2 \le |r|<0.4 - weak$ relationship; $0.4 \le |r|<0.7 - moderate$ relationship; $0.7 \le |r|<0.9 - quite$ strong relationship; $|r|\ge0.9 - very$ strong relationship.

3. Empirical analysis of the impact of human capital on V4 innovation

The first indicator to be analyzed is the ratio of the number of students to the number of academic staff (**Table 1**). It is important because intellectual capital is created through education, and higher education, in particular. It is in academic centers that talents are born, which in the future will determine the strength of R&D departments in enterprises.

According to the analysis, the largest negative change in the ratio of the number of students to the number of academic staff was recorded in the Czech Republic (-5.7 p.p.), while the lowest negative change was recorded in Poland (-2.1 p.p.).

Table 1: The ratio of the number of students to the number
of academic staff in 2013-2020 in the V4 countries

Year Country	2013	2014	2015	2016	2017	2018	2019	2020	М	Me	Q1	Q ₃	Structure [PL = 100%]	Changes compared to 2013 [p.p.]
CZ	21.9	22.3	22.9	18.9	18.4	15.0	16.8	16.2	19.1	18.7	16.8	22.0	133.2	-5.7
HU	14.8	15.1	14.6	13.7	12.1	11.5	11.4	11.3	13.1	12.9	11.5	14.7	91.3	-3.5
PL	15.1	15.2	14.9	14.6	14.3	13.8	13.5	13.0	14.3	14.5	13.8	15.0	100.0	-2.1
SK	13.8	13.7	13.0	12.4	11.9	11.4	11.3	11.4	12.4	12.2	11.4	13.2	86.5	-2.4
UE-27	n/d	15.4	15.4	15.1	15.3	n/d	n/d	n/d						

Legend: CZ – Czech Republic, HU – Hungary, PL – Poland, SK – Slovakia, M – arithmetic mean, Me – median, Q_1 – first quadrille, Q_3 – third quadrille, n/d – no data.

Source: Own elaboration after: Eurostat:

https://ec.europa.eu/eurostat/databrowser/view/EDUC_UOE_PERP04 __custom _4283841/default/table?lang=en; Accessed: 15.12.2022.

A decrease in this indicator was observed in all countries of the Visegrad Group. When examining the average ratio of students to the number of academic staff, it can be seen that the highest was in the Czech Republic (19.1), and the lowest in Slovakia (12.4). Between Poland and the Czech Republic, the ratio was 133.2% in favor of the Czech Republic. Lower values than Poland, however, were recorded by Hungary and Slovakia, of which Slovakia fared the worst (86.5% compared to Poland). Another analyzed measure in the area of human capital is public spending on higher education in the V4 countries (**Table 2**).

-	-	-	-											
Year Country	2012	2013	2014	2015	2016	2017	2018	2019	М	Me	Q1	Q ₃	Structure [PL = 100%]	Changes compared to 2012 r. [p.p.]
cz	1.05	0.88	0.80	0.77	0.70	0.70	0.92	0.93	0.8	0.8	0.8	0.9	74.5	-0.12
HU	0.82	0.90	0.77	0.66	0.76	0.82	0.81	0.74	0.8	0.8	0.8	0.8	69.3	-0.08
PL	1.15	1.21	1.18	1.22	1.06	1.08	1.06	1.10	1.1	1.1	1.1	1.2	100.0	-0.05
SK	n/d	0.97	0.97	1.39	0.83	0.79	0.76	n/d	1.0	0.9	0.8	1.0	84.0	n/d
UE-27	1.23	1.24	1.24	1.18	n/d	1.18	1.19	1.19	1.2	1.2	1.2	1.2	106.6	-0.04

Table 2: Public expenditure on higher education in 2012-2019 in the Visegrad Group countries [% of GDP]

Legend: CZ – Czech Republic, HU – Hungary, PL – Poland, SK – Slovakia, M – arithmetic mean, Me – median, Q_1 – first quadrille, Q_3 – third quadrille, n/d – no data.

Source: Own elaboration after: Eurostat:

https://ec.europa.eu/eurostat/databrowser/view/EDUC_UOE_PERP04 __custom _4283841/default/table?lang=en; Accessed: 15.12.2022.

In 2019, the Visegrad Group countries, when compared to the situation notified in 2012, recorded a decrease in public spending on higher education. The largest decrease in public expenditure for this purpose was observed in the Czech Republic (-0.12 p.p.). In Poland, the change compared to 2012 was -0.05 p.p. In addition, it can be observed that the reduction of the index began in 2016, when the authorities in Poland changed and a number of social packages (e.g. 500+) were introduced, which are an extremely heavy burden on the country's budget. Compared to other countries of the Visegrad Group, Poland fared very well in this respect, thus ahead of all other V4 countries. For example, the largest difference concerned Hungary (69.3% in relation to Poland), and the smallest in Slovakia (84.0% in relation to Poland). Another analyzed indicator directly corresponds to innovation and concerns human resources in science and technology (HRST) in the V4 (Table 3).

Group	on oo	ntries	in 21	012-2	2021	ane % of	f tota		ulati				ayeu	0-07		usegiau
Year Country	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Σ	Me	à	ő	Structure [PL = 100%]	changes compared to 2012 r. [p.p.]
CZ	31.8	32.7	33.7	34.0	34.8	36.1	36.5	36.6	37.6	38.9	36.0	36.3	34.8	36.9	98.1	7.1
F	29.3	30.0	30.8	31.6	31.4	32.0	33.0	34.1	35.6	37.6	33.3	32.5	31.6	34.5	90.6	8.3
Ы	30.5	31.7	32.9	34.0	35.1	36.5	37.5	38.4	39.3	40.1	36.7	37.0	35.1	38.6	100.0	9.6
SK	28.3	28.5	29.0	29.7	30.4	31.5	33.1	34.3	35.7	37.5	32.7	32.3	30.4	34.7	88.9	9.2
UE-27	35.2	35.9	36.7	37.4	38.1	38.9	39.8	40.7	41.7	42.3	39.5	39.4	38.1	41.0	107.4	7.1
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and technology (HRST) aged 25-64 in the Viseorad science 2 recontroes Table 3. Human

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The results of the analysis show that changes in human resources in science and technology in each country of the Visegrad Group between 2012 and 2021 were positive. The highest increase between the first and last analyzed year was recorded in Poland (9.6 p.p.), closely followed by Slovakia (9.2 p.p.). On the other hand, the slowest growth concerned the Czech Republic (7.1 p.p.). The average percentage of human resources in science and technology in the EU was higher than Poland's by 7.4 p.p., with Poland again performing well against the background of the V4, as the largest difference concerned Slovakia (88.9% compared to Poland), and the smallest disproportion concerned the Czech Republic (98.1% compared to Poland). Expenditures in the enterprise sector for research and development in 2012-2021 in the V4 were also analyzed (**Table 4**).

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In 2021, the highest expenditure on research and development in the enterprise sector among the V4 countries was incurred by business entities from the Czech Republic (EUR 279 per capita) and Hungary (EUR 196.3 per capita). Nevertheless, the observed EU average highlights the significant disparities between the V4 countries and the EU. For example, the average for the analyzed period for Poland was EUR 91.6 per capita, while for the EU it was EUR 424.3 per capita. Definitely the highest increase in expenditure was observed in Poland (410.7%), while the slowest rate of change was observed in the Czech Republic. The ratio of average expenditure on R&D to Poland was higher in the Czech Republic and Hungary. Poland lost the most to the Czech Republic (233.9%). The biggest difference in favor of Poland concerned Slovakia (76.1%). Finally, the number of applications to the EPO in 2012-2021 among the V4 countries was examined.(Table 5).

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Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	×	æ	ð	ß	Structure [PL = 100%]	Changes compareed to 2012 r.[%]
CZ	139	149	167	213	190	205	248	198	206	203	203.8	204.0	198.0	207.8	41.4	146.0
ΠH	105	103	114	66	110	94	118	100	109	118	107.8	109.5	100.0	115.0	21.9	112.4
Γ	385	371	482	568	411	469	519	469	478	539	491.9	480.0	469.0	524.0	100.0	140.0
SK	35	29	26	48	42	41	51	42	54	42	43.3	42.0	42.0	48.8	8.8	120.0
UE-27	60 465	60 991	62 618	62 561	62 210	63 817	66 181	66 459	65 925	67 713	64 685.5	64 871	62618	66250.5	13150.8	112.0
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The analysis of the dynamics of changes in the number of applications to the EPO between 2012 and 2021 shows that all Visegrad Group countries have increased their activity in this regard. The largest increase was recorded in the Czech Republic (146.0%) and Poland (140.0%). The highest average number of patents reported in the analyzed period was reported by Poland (491.9 patent applications), and the lowest by Slovakia (42 applications). Please note that these are absolute values. It should be interpreted quite differently in the case of relative values, e.g. when taking into account the number of inhabitants of individual V4 countries. The next stage of the research involves conducting a correlation analysis of selected relationships. The results are presented in **Table 6** in the order of decreasing significance of the examined relationships.

Table 6: F	Research	on the	relationship	between	selected
human ca	oital indic	ators an	d innovation	indicators	5

Type of relationship	Pearson's correlation coefficient
Expenditure in the enterprise sector on research and development and applications to the EPO (2012-2021)*	0.89036
Human resources in science and technology (HRST) aged 25-64 vs. expenditure in the enterprise sector on research and development (2012-2021)*	0.7294
Public expenditure on higher education and applications to the EPO (2012-2019)*	0.55566
Human resources in science and technology (HRST) aged 25-64 and applications to the EPO (2012-2021)*	0.55383
Public expenditure on higher education and human resources in science and technology (HRST) aged 25-64 (2012-2019)*	0.33015
Public expenditure on higher education vs. expenditure in the enterprise sector on research and development (2012-2019)*	0.31291
Ratio of students to the number of academic staff and expenditure in the enterprise sector on research and development (2013-2020)*	0.27516
Ratio of students to the number of academic staff and human resources in science and technology (HRST) aged 25-64 (2013-2020)*	0.10376
Ratio of students to the number of academic staff and public spending on higher education (2013-2020)*	0.06585

Legend: * Due to the lack of complete data in official statistics, the correlation analysis was carried out in divergent research periods. **Source:** Own elaboration and calculations.

After analyzing the relationships between the studied predictors, it was possible to determine the strength of the relationship between the individual related assets. Two dependencies turned out to be quite strongly correlated: /1/ the one linking expenditure in the enterprise sector on R&D with applications to the EPO; and /2/ the relation linking human resources in science and technology with expenditure in the enterprise sector on R&D. Another group of dependencies is characterized by a moderate degree of correlation and includes the following relations: public expenditure on higher education vs. applications to the EPO; and human resources in science and technology vs. applications to the EPO. It is also possible to identify pairs of measures characterized by a weak relationship, and these are: public expenditure on higher education vs. human resources in science and technology: public expenditure on higher education vs. expenditure in the enterprise sector on R&D; and the ratio of students to the number of academic staff vs. expenditure in the enterprise sector on R&D. In the case of the other examined relationships, it should be noted that they did not show a linear relationship, because there was an inequality of |r| < 0.2. In addition, it can be seen that all relationships were characterized by a positive correlation, which should be interpreted as follows: both features simultaneously increased or decreased in the same direction.

Conclusions

The aim of the considerations was to identify and quantify the impact of human potential on the level of innovation of the Visegrad Group countries. The selected research goal was achieved through the Pearson correlation analysis. Five measures were selected for the research in an arbitrary manner, guided mainly by the research intuition.

In the course of the analysis, the following conclusions were drawn:

- the increase in R&D expenditure in the business sector resulted in the simultaneous increase of the number of applications to the EPO;
- the increase in human resources in science and technology resulted in the simultaneous increase of the expenditure of enterprises on R&D;

- the number of applications to the EPO increased along with the increase in public spending on higher education;
- the number of applications to the EPO increased along with the increase in human resources in science and technology;
- human resources in science and technology increased along with the increase in public spending on higher education;
- together with the increase in public expenditure on higher education, there increased the expenditure of enterprises on R&D.

Conducting the research process allowed to find answers to the research questions posed in the introduction. In response to the first of them, whether all the studied relationships show a linear relationship, it should be stated that such a situation does not take place, because two of the examined relationships did not show a linear relationship, as received coefficient is less than 0.2. The other pairs of predictors showed a linear relationship. Two of them were characterized by a fairly strong relationship, i.e. $0.7 \le |r| < 0.9$; the next two were moderate, i.e. $0.4 \le |r| < 0.7$; and the next three were weakly related, and so $0.2 \le |r| < 0.4$.

In response to the second question, which of the tested pairs of measures are characterized by the greatest strength of association, it should be noted that two such dependencies have been identified, namely the relation between the expenditure in the enterprise sector on R&D and the number of applications to the EPO (r=0.89); and the relation between human resources in science and technology and the expenditure of enterprises on R&D (r~0.73).

The study may have practical implications for managers of enterprises in the V4 countries, who can increase the potential of human capital through investments in education and training as well as research and development activities; additionally, the increase of the innovative activity of the organization can also be undertaken.

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ARTICLES

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CLEAN SURPLUS MODEL IN EQUITY VALUATION AND FINANCIAL DATA QUALITY CONTROL

Abstract:

The article deals with the valuation of equity, in particular of shares that cannot be valued on the basis of market data. The clean surplus model is one of the models that allows the valuation of shares that are not marketable. The article presents the role of accounting and theoretical foundations, as well as the concept and assumptions of the clean surplus model. The model is related to financial research. In addition, the model can be used to confirm the reliability of the figures.

Keywords: surplus, model, valuation, shares, cost of capital.

JEL classification: M41

Paper type: Theoretical research article

Introduction

Business owners are interested in increasing the value of their shares in a company. The valuation of these shares is of interest to finance. The tool for this is the use of financial data accumulated in the company's information system or market data. While it has become quite common to use market data, it is less common to use internal company data, which best describe the economic reality, its internal determinants. These data are influenced by both internal and external factors and should therefore

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provide a good basis for assessing and valuing the company. Although internal financial data is only historical, and market data can include announcements, statements of intent, even financial markets are not fully informative. Therefore, valuation in models based on accounting data can be useful in reality, can provide knowledge of fundamental information about the company. The fundamental purpose of accounting is to provide as complete and transparent information as possible about the company. For this reason, accounting is subject to strict legal constraints aimed at standardisation and the production of high-quality financial data. The development of accounting and the synthesis of its achievements with those of finance provide new insights into valuation and its determinants. The purpose of this article is to present the Clean Surplus Model for valuing securities as a complement to the market-based methods commonly used in finance.

The purpose of this article is to present, discuss and demonstrate this model. It is structured in such a way as to first outline, albeit in a very simplified way, the material basis of double-entry bookkeeping and its evolution towards the surplus model. Then, using the model, the possibility of ex-ante evaluation and estimation of the cost of capital was examined, as well as the use of the model in assessing the reliability of financial information. English language literature has been used to achieve the purpose of the article.

The object of study in accounting theory

The essential feature of accounting is its close connection with economic phenomena in the enterprise and their proper estimation and presentation. As a practical occupation, it has also become an object of scientific interest. The purpose of this research has been to formalize practical relationships and to search for basic relationships and theoretical foundations. Research is still underway on the mathematical foundations of accounting, but it is also linked to the theory of finance, particularly the theory of capital². This search relates to Luca Paciolli's fundamental principle of double entry accounting.³ An area of research interest is the question of net worth, as a certain result of economic activity, which also relates to the fundamental purpose of financial management in a company. Net value is naturally associated with the residual value to which the owners are entitled, called pure surplus in the concept. This value corresponds to accounting profit, but even more clearly to economic profit.

² D.P. Elerman, 1982.

³ L. Pacioli, 1494.

Accounting, in principle, is a specific way of presenting and aggregating economic transactions, so it shows a relationship not only with regard to the simplest mathematical operations like summation, where one can check the correctness of accounting, but also shows some references to future and present value as certain financial categories and related to financial theory. The study of pure surplus (a.k.a. net worth) does not lead to the determination of accounting rules, but rather to the use of collected data to better understand the essence of accounting. The concept of clean surplus is distinguished from so-called "dirty surplus" in that only nonaccidental factors affecting the surplus are pointed out. The recorded financial data in the entity's accounting form the basis for the valuation of shares, with a view to the following year and beyond. The results of these calculations have a solid basis in strict figures, which, however, are not always correct. The application of the clean surplus model can lead to two types of conclusions, as to the substance of the valuation and suspicion of the correctness of the data on the basis of which the valuation is carried out. The greatest benefit of the model is that it obtains information about the valuation of shares from internal accounting data, rather than based on market data (which, by the way, only a few companies have access to). Naturally, this valuation cannot lead to a definitive conclusion as to the correctness of the valuation, but only to a high probability of valuation and suspicion of bias in the data or confidence in the figures used.

Currently, a popular trend in the development of accounting as a scientific discipline is the use of the Fentham and Olhson⁴ surplus model to measure net worth, which is a measure of the benefits of a business. This trend has brought research interest closer to the field of finance studies. However, this is not the first such rapprochement, as a common area of interest has been the interest in inflationary phenomena as affecting economic phenomena reflected in an entity's accounting (this has also been realized in the form of demands for accounting under conditions of high inflation and the need to index financial data). Moreover, the search for answers to the results of investments, the NPV (net present value) formula found its way into the field of finance, but also imprinted itself on the orientation of thinking and use of present value in entity accounting. "Discoveries" within accounting plays in the activities of business entities will be presented, to then refer to the development of thought in accounting.

⁴ G.A.Ohlson, J.A. Fentham, 1995.

The role of accounting and the quality of financial data

The main role of the accounting information system is to provide unique information about the enterprise and for proper management. However, it is impossible to argue that accounting is limited to an informational role in the enterprise. In particular, these main tasks include:⁵

- 1. To determine tax payments,
- 2. Enabling managers to evaluate management performance,
- 3. Calculation of economic indicators showing comprehensively the results of the company's management, providing the basis for assessing financial condition,
- 4. Influence positively or negatively the price of shares when the company is listed on the stock exchange.
- 5. Influence the policy of profit distributions.

Proper accounting therefore influences decisions through the correctness of data by collecting, processing and presenting it. The fundamental issue, therefore, is the correctness of the data, which is not easy to achieve due to the linking of results to the evaluation of management effectiveness and the prediction of the effects of decisions. The latter is a very ambitious but not unreasonable approach. After all, if accounting collects information, processes it, etc., then as long as the data is reliable, it is the basis for decision-making. One of the fundamental issues is the accumulation of information with different meanings and cause-and-effect relationships. Thus, a marginal part of the data has an apparent or weak cause-and-effect relationship, but those in the relevant time horizon are random variables. The decisive picture should be formed by data that have a close cause-and-effect relationship. This is an essential premise for the correctness of the economic surplus model. The following presents the concept of a clean surplus model, where only those variables with substantive justification are distinguished, and using the implications of double entry accounting.

However, there are also reasons to believe that errors appearing in financial information may be biased or even intentional⁶. Such errors cause decision-making errors. When there are no perfect financial markets in terms of information⁷, information is particularly valuable, and the holder of such information gains advantages that he can exploit, but at the expense of other market participants. Thus, the convergence of forecast results on the basis of the surplus model may indicate a high probability of good quality data on which accounting is based. However, the discrepancy may indicate the phenomenon of manipulation of financial data.

⁵ Wolk, H.I., Dodd, J.L., & Rozycki, J.J. (2017), s. 2.

⁶ Intentional manipulations can be fraudulent.

⁷ A.Damodaran, 2017.

Theoretical basis of accounting

The theoretical search led from double entry accounting to the dirty and clean surplus model of economic accounting. Accounting as a scientific discipline is basically based on a very universal and simple equation. The concept of accounting as a very practical discipline derives from the socalled principle of double entry accounting, which is not so much a fundamental assumption of the concept, but a foundation embedded about the observation of duality of transactions. The implication is that first: the theoretical foundation was sought on the basis of accounting practice. Secondly, there are certain relations between standards and practical occupation are indirect. This is presented in the following diagram.



Figure 1. The Financial Accounting Environment

Source: Wolk, H., Dodd, J., & Rozycki, J. (2017).p.5.

Essentially, accounting theory plays the role of explaining and justifying relationships in financial statements. It was not until the second half of the twentieth century that accounting theory was merged with financial theory.⁸ Historically speaking, this combination is very recent. This is illustrated by the following diagram:

⁸ D.P. Elerman, 1985.



Figure 2. Podstawy teoretyczne rachunkowości



The latest trend in research is the determination of net worth (the surplus earned after covering the costs of operations). The originals of this research appeared in Ohlson and Fentham (1995). However, before this discussion, it is necessary to trace the connections of this research to the previous ones and to uncontroversial accounting principles, in particular, the double entry principle. The following presents the principle of double entry in its strict and developed form. This is shown in the following table 1.

Table 1. Abbreviated and expanded form of L. Pacioli's double entry accounting principle.

Assets (type of assets)= total capital (property rights),
Assets= equity + liabilities,
Assets= equity+ liabilities+ net worth
Assets + expenses= equity + liabilities + income + net worth

Source. Own study

The development of the identity shown above is obvious from a purely mathematical point of view. However, the matter is not so trivial from an economic point of view. After all, there are many possibilities for the detailed formation of identity in the mathematical sense. But the issue is the economic sense of identity. After all, the accounting system is also not a legislative creation, but has a close relationship with economics. The equation is also applicable to the recording of public funds, where assets do not play an important role, such as the state budget. A certain practical shortcoming would be the application of the same principles of accounting for economic operations in a market economy entity, where the accrual principle is most relevant, and in a budget where it is not the expenses incurred that matter, but the actual ability to accumulate cash and spend it. Hence, the cash basis should replace the accrual principle in the latter case. Substituting costs for expenditures, and revenues for receipts, a different identity can be obtained, when it is the cash basis that is essential in the accounting of governing bodies of public institutions like budgets – table 2.

Assets+expenditures=equity+liabilities+inflows + net worth
Expenses= Receipts + net worth
Source: Own study

In this approach, however, both the concept of assets and sources of financing lose their economic sense, as they are of a different nature. If we are already talking about the budget then resources are less important than flow streams. Then the equation takes on a different universal form:

In the budget, net worth is also a key value because it determines the result of collecting and spending income. It then determines the surplus or shortfall. The development of the above identity could involve the inclusion of budget revenues and expenditures⁹. Pure surplus here, however, usually defines the negative phenomenon of deficit. The above proves how universal is the law of balance sheet equilibrium, or simply the principle of double entry accounting (the other as universal as the law of supply and demand). Since in the above equations net worth is the resultant of many financial streams without distinguishing between accidental, speculative growth and others, the above equations lead to a dirty surplus. Wanting to obtain an economically correct model, it is necessary to turn to cause-effect relationships.

It should be noted that net worth plays a key role in the equation, since without it, the identity would lose its economic sense, since the purpose of farming is to earn a profit or economic surplus, which in financial terms is also subject to economic risk. Another development of the identity can be to take into account the change in value due to acquisition and appreciation, for example in table 3.

Table 3. The most developed double entry accounting formula

Assets+ acquired assets+ expenses= equity+ liabilities+ incremental liabilities + net worth+ value of incremental financing.

Source: Own study

⁹ Unlike expenditure and income, these represent cash flows that do not represent a definite use, but are subject to reimbursement.

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Before the research on net worth, in the subsequent search of researchers in the field of accounting, there were achievements regarding the numerical relationships found between the various elements, which today can be described in the form of lines of relationships, which in English-language accounting is called in free translation: brick accounting (brick accounting). Relationships determined in this way are in the form of line functions, so they form the form of matrices, to which matrix calculus is applicable. Such presentation, however, is a very detailed notation, which, however, does not immediately have a general theoretical meaning and does not provide new properties of accounting. Examples of relationships can be in table 4.

Table 4. Universal examples of relationships between elements of financial statements.

Prior period fixed assets- depreciation+ acquired fixed assets= current period fixed assets,
Prior period cash+ Net profit+ depreciation+ other net cash flow= current period cash,
Net profit= income - expenses.

Source: Own study

In fact, more such dependencies can be found, which makes accounting very flexible. Still, the lines of dependencies are obvious from a mathematical point of view, and this adds little to the new developments in scientific discovery. In a practical sense, the dependencies are universal in nature allowing obvious errors to be caught. In cognitive terms, only the last concept seems to provide a basis for scientific inference. This is the concept of pure economic surplus. This theory allows practical application to practice, as it allows you to determine the correctness of the figures contained in the financial statements, to learn about the efficiency of management and confirm with a certain degree of certainty the reliability of financial data. This task is carried out not under certain conditions, but with a certain amount of risk.

The essence of the clean surplus model

The premise of the clean surplus model is founded on the distinction between the imperfection of accounting valuation and market value. The model refers to the concept of normal and extraordinary profits in economic theory. Extraordinary profits result from a company's market reputation, undervaluation of material rights held (trademarks, patents, results of research work) which accounting does not perfectly capture. At the same time, it corresponds to the fact that normal profits cover the owners' working time, the opportunity cost of financial decisions, hence for their determination in the model the economic cost of capital is used. With

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regard to extraordinary profits, assumptions of actual profits earned that can be determined by the popular ROE and ROA (return on equity; return on assets) ratios are used. Given ROE, the valuation of shares will include the impact of leverage. The authorship of this model is attributed to Ohlson and Fentham¹⁰. Its essence is expressed in the following equations in table 5.

Table 5. Basic mathematical identities in Ohlson and Fentham's clean surplus model.

Book value of net worth (at time t)= Book value of net worth (at time t-1)+ income (up to time t)- dividends (at time t),

Market value (at time t)= Book value of net worth (at time t)+ all future residual income discounted at rate i Source: G.A Feltham, J.A.Olhson 1995.

The idea behind this theory is to use book values to estimate future values in the financial statements, particularly the value of shares. While it is important to realize that financial results are influenced by a variety of factors, the model distinguishes between the influence of deterministic to stochastic factors. The latter are treated as deviations from the relevant trends set by the cleaned financial data; hence the model's name. Using the model, one can also achieve an estimate of the cost of capital, thus meaningful information about capital, and the differences between the estimated values of equity and its actual value are treated as the random influence of the other factors; hence the accuracy of the model should be high, since the other factors are random. Model accuracy can also be considered an essential feature of financial data from which the values are estimated. The opposite is interpreted as high discrepancy.

The two equations relate to each other by analogy, as they have a similar structure. From 1 equation in Table 6 below, one can see purely accounting/bookkeeping relationships, in the other market relationships, which are not always available. This is also the difficulty of market-based pricing, but also the strengths of the theory. In order to properly understand the concept of pure surplus, it should be noted that there is a kind of "gap" between the values reported in the financial statements, because part of the value is recorded at historical value, part of the liabilities may not be included in the balance sheet such as lease obligations, trade secrets, the company's consumer portfolio, patents, the results of development research, i.e. elements that are financially significant and make up a unique market position or investment intentions, and this is not reflected in the financial statements. This unique market position determines the present

¹⁰ G.A Feltham, J.A.Olhson 1995.

value of future windfall profits. Both recorded values form goodwill and those that are not included in the accounting system.

Table 6. Mathematical identities in the financial surplus model when estimating surplus value.

Goodwill (t)= book value (t)+ unique residual value,
Unique residual value= sum of present value of extraordinary profits,
Sum of present value of extraordinary earnings= expected earnings - accrued discount,
Expected profits= ROE* opening book value,
Accrued discount= cost of capital * book value at opening of books.
Book value(t+1)= book value (t)*[1+(1- dividend payout ratio)*ROE].
Rate of return of the company= risk-free rate*(1-beta)+ beta*market rate of return.

Source: G.A Feltham, J.A.Olhson 1995.

Note that not all data need to come from accounting data, they can be replaced by market data. The company's rate of return can also be estimated based on the arbitrage pricing model (APT), or the Gordon dividend model, or the capital asset pricing method (CAMP), but then market value data are needed. It is therefore recommended to base the return estimate on the arbitrage valuation.

Clean surplus model vs. selected valuation models in finance

The most popular method of valuing capital assets is the Capital Asset Pricing Model (CAPM) is based on financial data from the capital market, where the company's shares are priced. For this reason, the clean surplus model can be used in the absence of such market data. And yet most companies in Poland cannot value their assets in this way. Thanks to the economic surplus model, it is possible to estimate this value and relate it to the cost of capital in that company. Comparison with the most popular valuation methods, is shown in the table 7 below.

	Capital Assets Pricing Model	APT model	Clean surplus model		
Use of internal financial	No use	To a small extent	Yes		
Emphasis on the calculation of the cost of capital	Fundamental matter	Fundamental matter	Minor		
Extraordinary earnings	No reference	No reference	Essential issue		
Verification of the accuracy of financial data	None Potentially possible	None Potentially possible			
Impact of market factors on valuation	Significant	Significant	Not Significant		
Capital structure issue	Relevant to valuation	Relevant to valuation	Neutral to valuation		

 Table 7. Comparision of valuation with clean surplus model

Source: own compilation.

The strength of the clean surplus model, in addition to its reliance on accounting data, is that it is neutral to capital structure policy. Thus, the model does not explain the impact of this factor on valuation. From the point of view of economic interpretation, the main aspect is the valuation of shares, rather than, as in other models, focusing on estimating the cost of capital.

The pure surplus that the model estimates as a result is the actual profit purged of random factors, that is, the model highlights normal profit when the book valuation reflects the market reputation valuation, which is unrealistic. And when the accounting valuation completely ignores the valuation of market reputation, the valuation in the clean surplus model tends to value the residual. The following figure shows this:





Source: Own study.

It is not possible to clearly state that pure surplus will be associated with one category of profitability. It depends on the degree to which the broad issue of market reputation is included in accounting valuation. This one, in turn, is basically insignificant in Poland, except for the valuation of the surplus of assets over their fair value at acquisition. The economic surplus model, in this case, will be a useful tool for calculating this reputation and reliability of financial data.

Conclusion

The literature review carried out shows that double-entry accounting is a fundamental invention in the scientific basis of accounting. On its basis, new concepts of interdependencies emerge, although none of them has such a universal meaning, but a certain achievement is the reference to the theory of finance, as well as the formulation of numerous mathematical identities between the elements of the financial statements, which have practical significance. These identities have a linear function and thus allow a simple economic interpretation. The clean surplus model achieves two practical goals. The first is to perform valuations of ownership interests, and the second is to provide certainty - or the opposite - about the reliability of financial data. In practice, however, it will be difficult to distinguish between the two results. On the one hand, there is the advantage that accounting firms can obtain an estimate of the value of shareholdings but on the other benefits the efficiency of financial management. It is also worth noting that the role of double entry in accounting is not only a practical accounting rule, but also has great theoretical significance and is valid in the research conducted. It is clear that research in accounting is becoming increasingly similar to research in finance.

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THE EFFECTIVENESS OF MANAGEMENT CONTROL AS A TOOL FOR DEVELOPING THE QUALITY OF EDUCATIONAL SERVICES IN THE PUBLIC SECTOR

Abstract

The aim of the article was to measure the level of effectiveness of Management Control using a survey method among employees of educational institutions in selected aspects of management practice. The article discusses the basics of the Management Control System in the context of considering its effectiveness in shaping the quality of educational services. The basic understanding of Management Control in the public sector was presented and similarities and inspirations from management methods used in business practice were analysed.

The next part of the article presents the results of research among employees of educational institutions in the Mazowieckie Voivodeship. Conclusions from the research results concerned the perspective of the effectiveness of the Management Control System in public educational institutions.

The final conclusions discuss the weaknesses of Management Control and development elements constituting the basis for improving both the organizational aspects of educational institutions, as well as the level of human resources management.

JEL classification: 121, 125

Key words: management control, managerial control, public sector

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Introduction

The effectiveness of each organization is determined by the management tools and methods it uses. This applies to both the private and public sectors. In the case of industrial production, the implementation and improvement of standardized management systems seems to be the basis for functioning on the market. There is widespread awareness that a certified quality management system is the basis for cooperation between the manufacturer and the customer. In the public sector, it is necessary to define a simple and rational way of managing its resources, which ultimately translates into the quality of the services they offer. Therefore the aim of the article was to measure the level of effectiveness of Management control among employees of educational institutions in selected aspects of management practice in the context of considerations on the quality of educational services.

Each reform of the education sector was an attempt to create a system ensuring the continuity of the educational process, assuming rational management of public funds. An inseparable element was control, both in financial and pedagogical terms. Nevertheless, in the era of the development of management sciences, it was necessary to revise the methods and tools used so far, and to update the supervision over education with new practices developed in the private sector. Undoubtedly, one of such tools is managerial control. All units of the public finance sector are obliged to implement it, despite many critical voices regarding the creation of excessive bureaucracy. However, achieving its goals is only possible if it is fully understood what management control is, what its basic assumptions are and how it is intended to improve educational services. The discussed "services in the field of education and upbringing are one of the basic social services" (Gońda 2003, p. 109), therefore, care for their quality is one of the basic tasks of each state, whose priority should be to act adequately to the needs reported by the society.

1. The Essence and Areas of Managerial Control

1.1 Managerial Control in a Legal Context

Control is understood as a set of activities aimed at detecting irregularities in the functioning of a given entity. Managerial controls, on the other hand, are actions taken to achieve goals and tasks in accordance with the law, being efficient, cost-effective, and timely (Winiarska K., 2013, p.164). Therefore, it should not be understood as a mere checking activity, but rather as a specific system of managing functions in a public sector organization. As mentioned, this system is focused on goal achievement rather than detecting shortcomings (Kowalczyk E., 2010, p.26).

Managerial control represents a new approach to control in the public sector. Therefore, the Minister of Finance has published standards for managerial control, which serve as guidelines for creating, evaluating, and improving managerial control systems in public finance entities. These standards encompass five areas: (Official Journal of the Ministry of Finance, 2009, No. 15, item 84):

A - Internal Environment: Pertaining to ethical values, professional competencies of managers and employees, tasks, authorities, and responsibilities. This area also identifies sensitive tasks.

B - Objectives and Risk Management: Focused on setting objectives, monitoring task implementation, risk identification, risk analysis, risk response, and remedial actions.

C - Control Mechanisms: These mechanisms follow the risk identification process. They include documenting the control system, recording and approving financial issues, assigning key responsibilities, verifying business operations, direct supervision by superiors, documenting deviations from procedures, instructions, or guidelines, ensuring business continuity, selective and controlled access to financial, material, and informational resources (including IT control mechanisms such as access control to IT resources and software, application creation and change control, and access control to individual applications), and task division allowing for error detection and correction.

D - Information and Communication: Concerning the establishment of a proper internal and external communication system, enabling access to information for individuals who require specific information for proper task execution.

E - Monitoring and Evaluation: Enabling the assessment of the effectiveness of the implemented managerial control system and its individual elements, including self-assessment.

A noteworthy addition to the organization of managerial control is the identification and management of risk. One of the goals of this control is to properly focus on risk, which involves implementing an appropriate risk management model in the public sector. However, introducing this control element has proven to be quite challenging, resulting in a lack of risk management in a significant number of public finance entities, particularly in local government units.

1.2. Management Primer in the Private Sector Useful in Managerial Control

Selected elements of management practice have been implemented into the managerial control system in public sector entities. This includes elements such as building strategies, task perspective, and goal setting. Another element is human resource management. Defining and describing positions, responsibilities, and authorities form the basis of documentation for quality management systems based on ISO 9001:2015. Viewing Managerial Control as a management system also results in perceiving the citizen as a customer of the respective office, who must be served with the highest quality standards. Risk management is also a common area, which forms the basis for standardized management systems (e.g., risk management based on ISO 31000). Correlating aspects include:

- Identifying vulnerable points, particularly prone to errors.
- Focusing management efforts on tasks of significant importance due to high risk of failure, thereby increasing stability.
- Designing control tools appropriate to existing risks by governing bodies and directors.
- Optimizing organizational structure, including administrative apparatus and school personnel.
- Increasing the sense of responsibility of individuals managing public tasks for public resources and services.
- Orienting management towards processes rather than products.
- Taking a multidimensional view of the entity, including specific schools/institutions, through risk categorization (e.g., organizational, legal, reputational, and security risks) (Popławski M., p.11).

The introduction of Managerial Control and numerous references to risk management processes have shifted the "control" burden from oversight to management in a growing group of local governments in Poland. Managing tasks through risk can be simplified into a relatively straightforward management model, which should prove helpful for managers.

1.3. Documentation of Managerial Control System

Another element of managerial control that deserves attention is the process of documentation. In many entities, it happens that in order to fulfill the oral obligation of implementing control procedures, regulations are developed along with numerous attachments that constitute a collection of guidelines, instructions, or procedures, which then generate the need for further documentation. According to the employees performing the tasks of the entity, these documents serve no purpose and only create an obligation to create additional paperwork. It should be emphasized that in most entities, many mechanisms were already in place before the obligation to implement managerial control arose, which are inherent to this control. Therefore, it was necessary to organize and name them appropriately without the need to create additional documents. The behaviors of most entities, in the author's opinion, result from a lack of understanding of the mechanisms and purpose of managerial control, which is intended to increase the likelihood of achieving the set goals at every stage of their implementation.

2. Managerial Control in Educational Institutions

It is extremely important to note that all public educational institutions have been obliged to implement managerial control standards. This aims to modernize the methods of school management towards an organization that understands each student and their parent as a customer. In this perspective, the effective implementation of the organizational and educational processes is crucial to increase the efficiency of the school. Due to the complex nature of tasks related to education, including accounting, planning, organizational, but also educational and didactic work, which the managing body must face, apart from administrative activities, effective management activities are also required from it (Herbst, 2009, p. 17). The level of knowledge among individuals responsible for Managerial Control in educational institutions remains a matter of debate. This applies to both pedagogical supervision and task budgeting. Employees complain about the low level of knowledge due to conducted trainings, complex and extensive legal regulations, as well as the limited amount of literature and available content on the Internet.

3. Research on Evaluating Managerial Control in Terms of Effectiveness in Shaping the Quality of Educational Services

The quality of educational services is an extremely important element of building a state that is modern and open to development. Over the past 30 years after 1989, many reforms have been made, both in terms of the education program and the very structure of education management, including in detail specific educational institutions. This is primarily related to the financing of education from public funds, as well as the responsibility of the authorities for the education sector. It is unacceptable to waste public finances by individual schools or groups of schools, therefore it was necessary to create a control method that would be responsible for the efficient functioning of the entire education system. In recent years, the control associated with the search for defects has been replaced by the management control system, built on the model of standardized systems proven in the industry.

These systems are designed not only to search for losses and irregularities, but also to create an efficiently functioning body, consisting of people who properly manage the available resources and achieve the goals set for them. Certainly, public entities, including, above all, the school need

such a set of tools to treat the student and his parent as a client who should be served in accordance with the highest quality standards.

3.1. Characteristics of the Research Sample

For the purposes of this article, research was conducted among people responsible for implementing the Management Control system in educational institutions in the Mazowieckie Voivodship. The research was conducted in the first quarter of 2022 using the survey method. In total, 105 questionnaires were analysed. Five criteria were adopted to characterize the sample. The first criterion was the type of school

Criteria for the characteristics of the research sample		Type of school	Frequency	Percentage	
Type of school		secondary school	79	75%	
		technical school	27	25%	
	1.	less than 30 minutes	10	10%	
Time spent on Management Control	2.	from 30 to 60 minutes	18	17%	
(number of hours per week)	3.	from 1h to 2h	38	36%	
	4.	from 2h to 3h	15	14%	
	5.	over 3h	24	23%	
	1.	independent	73	70%	
How to acquire knowledge about Management Control	2.	with the help of a staff member from another school	15	14%	
		with the help of an external consultant	17	16%	
A source of acquiring knowledge about Management Control		Teaching materials	45	43%	
		Textbooks and studies	38	36%	
		Industry magazines	4	4%	
		Internet	18	17%	
	1.	own business	35	33%	
	2.	small company	8	8%	
Previous workplace		medium company	24	23%	
		big company	11	10%	
		foreign corporation	6	6%	
		public administration (offices, schools, hospitals, etc financed from the state budget)	21	20%	

Tab. 1 Criteria for the characteristics of the research sample

Source: own study

From the data analysis presented in Table 1, it can be concluded that the largest group of respondents consisted of employees responsible for Managerial Control in General High Schools (75%). Regarding the time dedicated to Managerial Control, 36% of employees reported spending 1 to 2 hours per week on topics related to this area. Every 10th employee spends no more than 30 minutes per week on Managerial Control duties, indicating a significant lack of interest in this area. Another interesting aspect is that 70% of respondents declared independently implementing and executing Managerial Control in their educational institution. The most frequently used source of information in this area is training materials (43%). It is noteworthy that there is infrequent use of industry journals, indicating that the topic of Managerial Control System is not widely covered in the literature. To assess knowledge awareness in management, respondents were also asked about their previous employment. One-third of the individuals had their own business (33%), while the smallest group of employees previously worked in foreign corporations (6%).

3.2. Descriptive Statistics of Observable Variables

In the next stage of the survey, employees evaluated the variables presented in the questionnaire using a Likert scale.

No.	Variable	Average	Standard deviation
1.	The level of knowledge about Management Control in educational institutions	4,35	1,47
2.	Level of proficiency in preparing Management Control documentation in your educational institution	3,98	1,47
3.	The level of awareness of acting in accordance with the law and internal procedures as part of Management Control	4,55	1,43
4.	The level of understanding of the responsibilities, authorities and responsibilities defined by the Management Control system among the staff of your educational institution	4,06	1,71
5.	The level of reliability of the prepared risk analysis as part of the Management Control	4,46	1,55
6.	The level of training on Management Control in educational institutions	4,27	1,51
7.	The level of effectiveness of Management Control in the context of improving the management of your educational institution	4,28	1,71

Tab. 2 Descriptive statistics of variables

Source: own study

Based on the analysis of Table 2 and Table 3, no significant deviations from the average ratings were noted. The average responses on the Likert scale for all variables fall within the range of 3.98-4.46. From a management perspective, this result is not very optimistic. Every management system aims to achieve the highest efficiency indicators. A moderate level of self-assessed knowledge, functioning proficiency, and compliance with legal regulations indicates that there is significant potential for the development of Management Control and, above all, the improvement of competencies in this area. Another interesting finding is the interpretation of variable number 4. With an average rating of 4.06 and a standard deviation of 1.71, the level of understanding of their own competencies by employees in educational institutions is relatively low. As

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many as 7 out of 105 employees responsible for Management Control in schools declared that the level of understanding of responsibilities and tasks by school staff is rated at 1. It is also noteworthy that the effectiveness of Management Control was rated highest by 80% of the respondents. This suggests that despite some shortcomings reflected in variables 1-6, the system itself was evaluated as effective. This may indicate that it is in the initial implementation phase and finding a new method to improve the system would be necessary.

1	Variable	Likert scale						
с.р.		1	2	3	4	5	6	7
1.	The level of knowledge about Management Control in educational institutions	8	6	36	108	190	60	49
2.	Level of proficiency in preparing Management Control documentation in your educational institution	4	24	63	152	60	66	49
3.	The level of awareness of acting in accordance with the law and internal procedures as part of Management Control	4	8	36	124	135	108	63
4.	The level of understanding of the responsibilities, authorities and responsibilities defined by the Management Control system among the staff of your educational institution	7	26	72	80	70	108	63
5.	The level of reliability of the prepared risk analysis as part of the Management Control	3	20	45	92	135	96	77
6.	The level of training on Management Control in educational institutions	4	18	60	100	115	102	49
7.	The level of effectiveness of Management Control in the context of improving the management of your educational institution	7	18	60	84	100	96	84

Tab. 3 Number of individual ratings on the Likert Scale

Source: own study

Conclusions

The Management Control System is in its early stages of maturity. Public organizations required time to develop specific documentation models and gain systemic understanding in order to implement the mandated standards. It represented a new perspective, transitioning from a control seeking flaws to planning and management. However, the standard itself is not free from shortcomings. Excessive bureaucratization and the lack of implementation and training phases have resulted in many components of the Management Control System being evaluated by educational institution staff at an average level.

From the perspective of similarity between the Management Control System and standardized management systems developed by the International Organization for Standardization (ISO), there is a missing element that allows for transitioning from ratings in the range of 3.98-4.06 to values closer to 7. The Deming Cycle, which serves as an introduction to every standard, appears to be a missing element in the logic of Management Control. The essence of any system is its continuous improvement, not just meeting requirements. Hence, task assignments alone cannot systematically indicate what can be done better and what elements can contribute to the development of more professionalism.

As a result of the conducted research, it was determined that updating the standard to incorporate modern Human Resource Management methods is necessary to improve the average rating of employee competencies, responsibilities, and duties. Every organization unlocks its development potential from the potential of its members. The evaluation within the average range of variables related to human resources will remain at that level if it continues to confine itself to bureaucratic forms of Management Control.

The research results also confirmed the effectiveness of the discussed system, indicating that its implementation was a positive step in modernizing public services, both in the educational aspect and in other areas where the citizen is the client.

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