
Assessment of the Relationship Between Innovativeness and the Financial Standing of Enterprises at the Voivodeship Level in Poland in 2018, 2021 and 2024

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Abstract:

Purpose: The purpose of this article is to assess the relationship between the innovativeness and financial standing of enterprises across Polish voivodeships in 2018, 2021 and 2024 by determining the direction, strength and changes in this relationship over time.

Design/Methodology/Approach: The study was based on data from Statistics Poland (GUS). Two synthetic rankings of voivodeships were constructed: one for enterprise innovativeness and one for enterprise financial standing. The TOPSIS method was used to aggregate the diagnostic variables, while Shannon entropy was used to determine the weights, ensuring objectivity of the assessment by eliminating subjective weight selection. The relationship between the rankings was determined using Spearman's rank correlation coefficient. The analysis was conducted for 2018, 2021 and 2024, taking into account methodological changes resulting from the implementation of the revised Oslo Manual and the change in the GUS data publication cycle.

Findings: The results indicate a low correlation between the rankings of enterprise innovativeness and financial standing in all the years analysed. At the same time, a systematic increase in the correlation coefficient was observed in successive periods, which may indicate a gradual strengthening of the relationship between the phenomena analysed.

Practical Implications: The findings may support the design of regional development strategies and innovation policy by providing information on the relationship between enterprise innovativeness and financial standing.

Originality/Value: The value of the study lies in its comprehensive assessment of the relationship between enterprise innovativeness and financial standing across voivodeships using a procedure for constructing synthetic rankings (the TOPSIS method with weights determined by Shannon entropy). An additional contribution is the analysis of changes in this relationship over time, covering a period of economic turbulence associated with the COVID-19 pandemic.

Keywords: TOPSIS, Shannon entropy, rank correlation, financial standing, innovation

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1. Introduction

Enterprise innovativeness is one of the key factors determining the competitiveness of an economy and its capacity for long-term growth. At the same time, innovation activity requires adequate financial resources and entails a higher level of risk (OECD/Eurostat, 2018). For this reason, stable financial standing may facilitate the initiation and successful implementation of innovation processes. However, the relationship between enterprise innovativeness and financial standing remains complex and ambiguous.

The purpose of this article is to assess the relationship between the innovativeness and financial standing of enterprises across Polish voivodeships in 2018, 2021 and 2024. The study focuses on determining the direction and strength of the relationship between the phenomena analysed and identifying changes in this relationship over time.

To achieve the stated research objective, the following research question was formulated: whether, and to what extent, the level of enterprise innovativeness is associated with financial standing across voivodeships, and whether this relationship changed over the period analysed?

The analysis was based on GUS data. As part of the study, synthetic rankings of enterprise innovativeness and financial standing were constructed using the TOPSIS method and weights determined by Shannon entropy, while the strength of the relationship between the rankings was assessed using Spearman's rank correlation coefficient.

The value of the study lies in its comprehensive analysis of the relationship between the phenomena examined, taking into account methodological changes in the measurement of innovativeness and the conditions associated with the COVID-19 pandemic. The findings may support the design of innovation policy and regional development strategies and provide a starting point for further research on the determinants of enterprise innovativeness.

2. Literature Review

Regional development depends to a considerable extent on the competitiveness and innovativeness of enterprises operating within the region (Piotrowska-Piątek, 2017). The level of enterprise innovativeness, in turn, depends on both internal and external factors.

Internal determinants include, in particular: creativity, entrepreneurship, management/leadership style, organisational culture, teamwork, the quality of staff and the employee motivation system, the adopted business strategy, the resources available and their quality, and structural and network linkages.

External factors mainly include: tax reliefs, access to sources of finance, the tax system, legal regulations, the efficiency of public administration, freedom of economic activity, research and development infrastructure, education, the degree of internationalisation of the enterprise's activities, technological progress, and the intensity of competition within the industry (Romanowska, 2016).

When considering enterprise innovativeness, however, it is important to define unambiguously the categories of entities participating in innovation processes. Enterprises engaging in innovation activity differ both in the scope of the activities undertaken and in the level of advancement of innovation processes and the results achieved.

Consequently, not all entities involved in innovation activity can be classified within the same category. From the perspective of analyses of innovativeness, it is therefore appropriate to distinguish between an innovative enterprise and an innovation-active enterprise. These categories refer to different dimensions of innovation activity and reflect different levels of advancement of innovation processes.

According to the definitions set out in the fourth edition of the Oslo Manual developed by the OECD and Eurostat (2018), an innovative enterprise is an entity that implemented at least one innovation during the observation period, regardless of whether it was developed independently or in cooperation with other entities.

An innovation-active enterprise, in turn, is an enterprise engaged in one or more activities aimed at developing or implementing new or improved products or business processes; this category also includes enterprises conducting research and development activities, irrespective of their purpose. This means that an innovation-active enterprise does not have to have successfully implemented an innovation during the period analysed, but only to have undertaken activities leading to its development or implementation.

Innovation itself is defined as the implementation of a new or significantly improved product (good or service) or business process that differs significantly from solutions previously used by the enterprise. Closely related to the concept of innovation is innovation activity, understood as the totality of developmental, financial and commercial activities undertaken by an enterprise with the aim of developing and implementing innovations.

It includes, among other things, research and development, engineering and design work, software development, marketing activities, intellectual property management, employee training, the acquisition of fixed assets, and innovation management activities. Innovation activity does not always result in the implementation of an innovation - it may remain ongoing, be temporarily postponed, or end with the abandonment of a project. The definitions cited, developed by the OECD and Eurostat in the Oslo Manual 2018, constitute an international standard for measuring

enterprise innovation activity and are also used by Statistics Poland in its statistical surveys of enterprise innovativeness (Główny Urząd Statystyczny, n.d.). This ensures the comparability of national results with international data.

The assessment of enterprise innovation activity should not be considered in isolation from enterprises' economic and financial position. The capacity to undertake and implement innovations is, to a considerable extent, conditioned by the financial resources available and the stability of the enterprise's operations.

Financial standing is a concept whose meaning varies depending on the context, research perspective and circumstances in which it is used. In the literature, the term most often refers to an assessment of an enterprise's financial and asset position carried out by financial institutions. From this perspective, financial standing is an important element of an enterprise's creditworthiness assessment, which directly affects its investment capacity (Kowalska, 2023).

At the same time, financial standing is a multidimensional category encompassing many aspects of an enterprise's operations (Lisek, 2023). Table 1 presents selected approaches to defining financial standing together with its dimensions.

Table 1. *Selected approaches to defining financial standing and its dimensions*

Author	Definition	Dimensions
Bednarski, Waśniewski, 1996	A set of ratios relating to liquidity, indebtedness, operating efficiency and profitability is used to assess an enterprise's financial standing.	Financial liquidity, indebtedness, operating efficiency, profitability
Siminica et al., 2008	An enterprise's financial standing is influenced by its economic resources, financial structure, liquidity and solvency, as well as its ability to adapt to changes in the environment.	Economic resources, capital structure, liquidity, solvency, adaptability
Csegedi et al., 2011	Financial standing focuses primarily on the quantitative aspect of an entity and is based exclusively on financial ratios.	Financial indicators
Kokot-Stępień, 2016	An enterprise's financial standing reflects its economic and financial condition and its potential to generate profit.	Financial strength, profit-generating capacity
Charaeva, 2018	Financial standing reflects the final results of an enterprise's activities.	Operating results
Kuciński, 2018	Financial standing refers to an enterprise's financial position.	Financial liquidity, profitability, indebtedness, efficiency
Kowalska, 2023	Financial standing is an enterprise's financial position determined by the extent and nature of the	Ability to generate, retain and allocate profit

	generation, possession and allocation of profit by the enterprise to sustain and develop social and environmental systems.	
Lipowicz, 2024	Financial standing understood as an entity's rating (a synthetic representation of an assessment of its future ability to meet its obligations in full and on time).	Ability to meet obligations
Kowalska and Misztal, 2025	Financial standing reflects an enterprise's ability to finance current operations and long-term strategic objectives using available assets.	Short- and long-term financing capacity
Gubareva et al., 2026	Financial standing is an enterprise's ability to finance current and future operations from its assets. The financial standing of manufacturing enterprises indicates their competitive market position, credibility and economic strength, and influences the level of counterparties' trust and loyalty.	Financing capacity, competitiveness, credibility, economic strength, trust, counterparty loyalty

Source: *Own compilation based on the literature sources presented in Table 1.*

The analysis of the definitions of financial standing presented in Table 1 confirms that the construct of an enterprise's financial standing is a multifaceted category referring to both its current and prospective capacity to finance business activity.

Moreover, it also encompasses the enterprise's market position. At the basic level, financial standing is understood in terms of the enterprise's financial position, its capacity to generate profits, and its ability to finance its activities. This approach emphasises that the construct of financial standing is firmly grounded in conventional financial analysis.

At the operational level, financial standing is assessed primarily using a set of indicators covering financial liquidity, profitability, indebtedness and operating efficiency. This points to the dominance of a quantitative approach based on financial measures (indicators), which enable a synthetic assessment of an enterprise's financial condition.

In addition, this approach includes market-related elements such as competitiveness, credibility, economic strength, and the level of trust and loyalty of counterparties. It also demonstrates the importance of financial standing in relations with the business environment. In this respect, relations with external stakeholders are particularly important, as they affect an enterprise's stability and how it is perceived in the market. Furthermore, dimensions such as economic resources, capital structure, solvency, and the ability to adapt to changes in the environment give financial standing a strategic dimension.

Financial standing should also be viewed as a systemic category assessed on the basis of interrelated financial variables. Its systemic nature stems from its multidimensionality and the complex interdependencies between its individual components, such as financial liquidity, profitability, operating efficiency and indebtedness. From this perspective, these variables reflect both the short-term effects of operating activity and the long-term determinants of enterprise stability, forming a coherent system for assessing financial standing.

Consequently, financial standing constitutes a system of interdependent categories whose identification and assessment are essential for operational and strategic decision-making and for stakeholders' assessment of the enterprise's condition (Kowalska, 2023). Importantly, these components jointly determine the level of financial security and the enterprise's ability to achieve its strategic objectives. Financial security, in turn, conditions the achievement of financial stability by the enterprise (Jabłoński, 2015). The structure of the system and subsystems for assessing financial standing is presented in Figure 1.

Figure 1. Components of the financial standing assessment system

FINANCIAL STANDING ASSESSMENT SYSTEM

- 1) Short- and long-term factors determining an enterprise's financial condition and its capacity for stable operation and development
- 2) Shaping financial security, understood as the ability to maintain economic equilibrium and limit financial risk

Financial standing assessment subsystems

Profitability as the ability to generate profit from operations

Financial liquidity as the ability to meet current liabilities

Operating efficiency as the efficient use of resources

Indebtedness as a reflection of the extent of debt capital use and financial risk

Source: Own compilation based on Kokot-Ściepień (2016), Kowalska (2023).

The basis for assessing an enterprise's financial standing is an analysis of financial performance, which can be conducted across four areas of activity. In this approach, a comprehensive assessment is based on the following subsystems: profitability, financial liquidity, operating efficiency and indebtedness.

Each of these provides different information on the enterprise's financial condition, while their combined analysis enables a comprehensive and multidimensional assessment of its financial position. The first area of analysis is profitability, which makes it possible to assess the efficiency of the enterprise's operations and management's ability to generate profits from the resources employed, as well as to allocate capital efficiently. Ratios dedicated to this area allow the enterprise's level of profitability to be compared with that of other entities in the industry.

High and increasing profitability is an important signal of good financial condition and indicates greater investment capacity (Gorzeń-Mitka and Błach, 2024). The second area of analysis is financial liquidity, which is a key element in assessing an enterprise's operations.

It depends on many factors of both an exogenous and endogenous nature and constitutes an important component of the assessment of the enterprise's financial position. It should be emphasised that, in the short term, an enterprise's market position is determined not only by the amount of profit generated, but above all by its ability to maintain financial liquidity.

Liquidity is also regarded as an important determinant of market credibility and the ability to continue as a going concern. Financial liquidity primarily reflects the ability to settle current liabilities on time, and maintaining it is widely regarded as a condition for the enterprise's continued operation in the long term (Pałczyńska-Gościńskiak, 2018; Sierpińska and Jachna, 2017). Another component of the assessment of financial standing is operating efficiency analysis.

Operating efficiency ratios are an equally important element of ratio analysis, providing information on the efficiency with which the enterprise uses its resources. In business practice, the most commonly used measures include inventory turnover in days, trade receivables turnover in days and trade payables turnover in days. Indicators of resource-use efficiency within an enterprise are largely determined by the specific characteristics of the industry and vary considerably across sectors (Wiatrzyk, 2018).

The final area of analysis is the assessment of indebtedness, which enables a multidirectional examination of the sources of asset financing, the capital structure and the efficiency of capital employed. Debt analysis distinguishes two principal groups of ratios: those reflecting the level of indebtedness and those providing information on the enterprise's debt-servicing capacity.

In particular, analysis of the financing structure uses a range of measures, including the total debt ratio, debt-to-equity ratio and long-term debt ratio. Analysis of debt-servicing capacity, in turn, includes the debt service coverage ratio and the interest coverage ratio. Their combined use makes it possible to assess the extent to which the enterprise's activities are financed with debt capital and to identify the level of financial risk (Sierpińska and Jachna, 2017).

Examining the relationship between enterprise innovativeness and financial standing constitutes an important yet complex area of research. The literature highlights numerous challenges associated with its analysis. These arise primarily from the complexity of both constructs and the absence of an unequivocally defined nature of their mutual relationship, which makes it necessary to take into account a range of methodological and contextual conditions that may significantly affect the results of

empirical research (Kruglov and Shaw, 2024; Sobolewski and Wściubiak, 2017; Socha, 2016). The key challenges identified in examining the relationship between innovativeness and financial standing are as follows (Sobolewski and Wściubiak, 2017):

- difficulties in quantifying innovation - both the definition and measurement of innovation are multidimensional and ambiguous; the use of different approaches, ranging from input measures (e.g., R&D expenditure), through resource indicators (e.g., human capital), to output measures (e.g., patents and new products), means that each captures only part of the complex innovation process, thereby limiting comparability and the overall adequacy of measurement;
- problems with measuring enterprise outcomes - the effects of business activity may be assessed both objectively (e.g., using financial ratios such as profitability) and subjectively (e.g., through expert assessments); at the same time, enterprises' limited willingness to disclose data and problems with the comparability of indicators mean that measurement of these effects may be incomplete and subject to a risk of distortion;
- the complexity of the relationship between innovativeness and financial standing - the impact of innovation on performance is neither simple nor direct; it may be delayed, depend on the type of innovation (technological vs organisational), and be conditioned by contextual factors such as the size, age or industry of the enterprise; moreover, innovation may exert an indirect effect, for example through changes in the business model, which further complicates the identification of its actual impact on financial standing.

3. Research Methodology

Data from Statistics Poland were used to quantitatively assess the relationship between the innovativeness and financial standing of enterprises operating in individual Polish voivodeships. For the purposes of the study, two synthetic indicators were constructed: an enterprise innovativeness indicator and an enterprise financial standing indicator. The selection of diagnostic variables was based on substantive considerations and reflected their relevance to assessing the level of innovativeness and the financial condition of enterprises.

An initial set of 16 diagnostic variables, classified as stimulants and destimulants, was adopted to construct the enterprise innovativeness indicator. These variables covered six areas of innovation activity: the share of innovative enterprises, expenditure on innovation activity, cooperation in innovation activity, the outcomes of innovation activity, research and development potential, and inventive activity and industrial property protection.

In turn, an initial set of 10 diagnostic variables, also classified as stimulants and destimulants, was selected to construct the financial standing indicator. These

described four basic areas of enterprises' financial position: financial liquidity, profitability, operating efficiency, and indebtedness and financing structure.

The initial set of diagnostic variables adopted to assess the level of enterprise innovativeness comprised: X1 - average share of innovative enterprises in the total number of enterprises (in %); X2 - share of expenditure on innovation activity by enterprises in national expenditure (in %); X3 - expenditure on innovation activity in industrial enterprises per capita (population as at 31 January of the given year);

X4 - share of innovative industrial enterprises in the total number of industrial enterprises (in %); X5 - share of innovative service-sector enterprises in the total number of service-sector enterprises (in %); X6 - share of service-sector enterprises that incurred expenditure on innovation activity in the total number of service-sector enterprises (in %);

X7 - share of industrial enterprises that incurred expenditure on innovation activity in the total number of industrial enterprises (in %); X8 - share of industrial enterprises that cooperated in innovation activity in the total number of industrial enterprises (in %); X9 - share of service-sector enterprises that cooperated in innovation activity in the total number of service-sector enterprises (in %); X10 - share of sales of new/improved products by industrial enterprises in the total value of product sales;

X11 - share of net revenue from sales of innovative products in total net sales revenue in industrial enterprises; X12 - in-house R&D personnel per 1,000 economically active persons (in FTE); X13 - invention applications filed with the Patent Office of the Republic of Poland (UPRP) per 1 million inhabitants; X14 - patents granted by the UPRP per 1 million inhabitants; X15 - rights of protection granted by the UPRP per 100,000 population and X16 - ratio of rights of protection for utility models granted by the UPRP to the total number of applications.

Similarly, an initial set of diagnostic variables adopted to construct the enterprise financial standing indicator comprised: X1 - third-degree financial liquidity ratio; X2 - second-degree financial liquidity ratio; X3 - net return on sales ratio (in %); X4 - return on assets ratio (in %); X5 - return on equity ratio (in %); X6 - inventory turnover in days; X7 - trade receivables turnover in days; X8 - trade payables turnover in days; X9 - total debt ratio and X10 - fixed assets coverage ratio by equity.

According to the statistical criteria, variables should be characterised by an appropriate level of variability (i.e., the coefficient of variation should exceed 10%) and low correlation (i.e., the absolute value of Pearson's correlation coefficient r should not exceed 0.75) (Zeliaś, 2002; Strahl, 2006). After applying the adopted statistical criteria, eight variables were ultimately selected for construction of the synthetic innovativeness indicator (i.e., X2, X3, X6, X7, X11, X14, X15 and X16),

while six variables were selected for construction of the financial standing indicator (i.e., X1, X3, X6, X7, X9 and X10).

The diagnostic variables were aggregated using the TOPSIS method (Hwang and Yoon, 1981), which enables the linear ordering of multivariate objects (Sharma *et al.*, 2018; Lam *et al.*, 2023; Gibowski and Łusiakowski, 2026b). The weights of individual variables were determined using the Shannon entropy method, which provides an objective means of determining their importance by limiting the influence of the researcher's subjective decisions (Kacprzak, 2018; Gibowski and Łusiakowski, 2026b).

Spearman's rank correlation coefficient was used to assess the relationship between the resulting rankings of enterprise innovativeness and financial standing (Purczyński and Klóska, 2015; Gibowski, 2026; Gibowski and Łusiakowski, 2026a).

The study was conducted for 2018, 2021 and 2024. The choice of this time horizon resulted from methodological changes in research on enterprise innovativeness associated with the implementation, from 2018 onwards, of the fourth edition of the Oslo Manual.

In addition, since 2022, data on enterprise innovation activity have been published by GUS on a biennial basis, which precludes annual analyses. The inclusion of 2021, in turn, makes it possible to assess the phenomena under study during a period of significant economic turbulence caused by the COVID-19 pandemic.

4. Research Results and Discussion

Table 2 presents the results of a comparative analysis of the level of innovativeness and financial standing of enterprises across Polish voivodeships in 2018, 2021 and 2024. For each region, the values of the synthetic indicators determined using the TOPSIS method and the corresponding ranking positions are presented. In addition, values of Spearman's rank correlation coefficient are reported, indicating the degree of correspondence between the ranking of innovativeness and the ranking of enterprise financial standing in each year covered by the analysis.

Table 2. *Rankings of Polish voivodeships by the level of innovativeness and financial standing of enterprises overall in 2018, 2021 and 2024*

Voivodeship	2018				2021				2024			
	Innovation		Financial standing		Innovation		Financial standing		Innovation		Financial standing	
	S _i	R.	S _i	R.	S _i	R.	S _i	R.	S _i	R.	S _i	R.
Dolnośląskie	0.130	8	0.434	12	0.242	4	0.313	16	0.145	6	0.678	10
Kujawsko-pomorskie	0.068	10	0.388	15	0.074	9	0.468	8	0.055	12	0.677	11

Lubelskie	0.052	13	0.670	3	0.073	10	0.548	4	0.059	9	0.978	1
Lubuskie	0.058	11	0.523	6	0.059	11	0.366	13	0.055	11	0.697	8
Łódzkie	0.341	2	0.342	16	0.105	8	0.381	11	0.051	13	0.061	15
Małopolskie	0.310	4	0.713	1	0.322	2	0.650	1	0.266	2	0.967	2
Mazowieckie	0.891	1	0.600	4	0.963	1	0.561	3	0.935	1	0.681	9
Opolskie	0.097	9	0.492	8	0.040	13	0.533	6	0.066	8	0.719	7
Podkarpackie	0.167	7	0.486	9	0.145	7	0.462	9	0.115	7	0.778	6
Podlaskie	0.045	15	0.496	7	0.031	15	0.531	7	0.056	10	0.580	13
Pomorskie	0.182	6	0.579	5	0.175	5	0.575	2	0.177	4	0.963	3
Śląskie	0.319	3	0.404	13	0.253	3	0.323	15	0.189	3	0.047	16
Świętokrzyskie	0.026	16	0.397	14	0.022	16	0.414	10	0.049	14	0.902	4
Warmińsko- mazurskie	0.057	12	0.437	11	0.042	12	0.380	12	0.049	15	0.558	14
Wielkopolskie	0.204	5	0.670	2	0.164	6	0.541	5	0.151	5	0.800	5
Zachodnio- pomorskie	0.046	14	0.464	10	0.031	14	0.352	14	0.043	16	0.619	12
Spearman's rank correlation coefficient	0.147				0.256				0.329			

Source: Authors' calculations.

The analysis of the results (Table 2) indicates substantial regional variation throughout the period examined, both in terms of enterprise innovativeness and financial standing. Mazowieckie held a clear leading position in the innovativeness ranking in all the years analysed (0.891, 0.963 and 0.935, respectively), indicating a persistent concentration of innovation potential in this region.

Małopolskie and Śląskie also maintained high positions, whereas Świętokrzyskie, Zachodnio-pomorskie and Podlaskie consistently remained at the bottom of the ranking.

A different picture emerges from the analysis of enterprise financial standing. In 2018 and 2021, Małopolskie achieved the highest values of the synthetic indicator, while Lubelskie was the leader in 2024. Wielkopolskie, Pomorskie and Mazowieckie also remained among the leading regions, although their positions changed in successive years.

At the same time, some voivodeships recorded a substantial improvement in their financial position despite a relatively low level of innovativeness, as exemplified by Lubelskie. By contrast, Śląskie, despite maintaining a high position in the innovativeness ranking, recorded the lowest enterprise financial standing of all regions in 2024.

A comparison of the two rankings indicates limited correspondence in the spatial distribution of the phenomena analysed. In many voivodeships, a high level of innovativeness was not accompanied by an equally favourable financial position of enterprises, while regions ranking highly in terms of financial standing were not always among the innovation leaders.

One example is Łódzkie, which ranked second in terms of innovativeness in 2018 while simultaneously occupying the last position in the financial standing ranking. Lubelskie, in turn, was placed towards the bottom of the innovativeness ranking while achieving one of the highest positions in terms of the financial condition of enterprises. Małopolskie stood out for its relatively high positions in both rankings, indicating greater coherence between innovation development and the financial position of enterprises in this region.

The limited correspondence between the rankings is confirmed by Spearman's rank correlation coefficients, which amounted to 0.147 in 2018, 0.256 in 2021 and 0.329 in 2024. The results indicate a positive but weak relationship between the level of innovativeness and enterprise financial standing. At the same time, a systematic increase in the coefficient is visible in successive years, indicating a gradual increase in the degree of correspondence between the two rankings.

However, the relationship remains relatively weak, suggesting that the financial condition of enterprises at the regional level is determined by a much broader set of factors than the level of innovation activity alone. Consequently, the results do not provide grounds for concluding that there is a strong and unequivocal relationship between innovativeness and the financial standing of enterprises in the voivodeships analysed.

The assessment of the relationship between innovativeness and the financial position of enterprises remains an area of research interest. Given the unquestioned importance of innovation for increasing enterprise competitiveness and for socio-economic development, the determinants of financial standing warrant attention. For example, a study based on a sample of innovative Polish enterprises included in a ranking published by the daily newspaper *Rzeczpospolita*, divided into public and private companies, did not provide unequivocal confirmation that a higher level of innovativeness is associated with better financial performance.

Nevertheless, it was observed that, in the period before and during innovation implementation, innovative private enterprises were characterised, on average, by lower operating efficiency as measured by asset turnover. In the year in which research and development expenditure was incurred, the enterprises analysed also recorded, on average, a lower return on equity. A positive effect of innovativeness, by contrast, was identified in public companies. In their case, a higher level of innovativeness coincided with a more favourable operating profit trend in the following year (Socha, 2016).

Some studies focus on analysing the relationship between the level of innovativeness and selected measures of development. One example is a study conducted among enterprises in the small and medium-sized enterprise sector. Analysis of the findings showed that the higher an enterprise's level of innovativeness, the higher its development measures, including profit growth (Lemańska-Majdzik, 2016).

Research conducted among 100 industrial enterprises, in turn, indicates that having sufficient own funds is an important financial condition stimulating innovativeness. Unfortunately, the long payback period for expenditure incurred on innovation and difficulties in obtaining credit for such activity constrain innovativeness (Poznańska, 2016). This may suggest a positive relationship between innovativeness and the level of an enterprise's equity.

This study focused primarily on examining the relationship between innovativeness and the financial position of enterprises at the regional level. The analysis suggests that the low positive correlation observed between the innovativeness and financial standing rankings in the years analysed may be attributable to limitations associated with measuring innovativeness and the outcomes resulting from it.

The complexity of the relationship between the categories considered may be an additional factor. The findings have both cognitive and practical value. They may contribute to a better understanding of the relationship between innovativeness and the financial condition of enterprises and support the development of regional strategies aimed at increasing competitiveness and financial stability.

5. Conclusions

The study showed that there is a positive but weak relationship between the level of innovativeness and the financial standing of enterprises at the regional level in Poland. The obtained values of Spearman's rank correlation coefficient indicate a gradual increase in the correspondence between the two rankings in 2018, 2021 and 2024; however, the strength of this relationship remains limited. This means that a high level of innovativeness does not translate directly and unequivocally into a better financial condition of enterprises in individual voivodeships.

The results also confirmed persistent and substantial regional variation in both the level of innovativeness and the financial position of enterprises. Mazowieckie consistently remained the leader in innovativeness, whereas the highest financial standing was achieved by different regions in individual years, indicating a different spatial distribution of the two phenomena analysed. The observed differences suggest that the financial condition of enterprises is determined by many factors, of which innovativeness is only one.

The results obtained are consistent with the conclusions of some studies presented in the literature, which point to the complex and ambiguous nature of the relationship

between enterprise innovativeness and financial standing. The economic benefits arising from innovation activity may become apparent only after a time lag, while their scale depends on numerous internal and external conditions, such as access to capital, the enterprise's organisational structure, industry-specific characteristics, and the region's institutional environment.

A limitation of the study is that the analysis was conducted at the voivodeship level and was based on aggregated data concerning enterprises operating in individual regions. The adopted perspective enables an assessment of regional variation but does not allow differences between individual enterprises to be captured or specific factors determining the relationship between innovativeness and financial standing at the enterprise level to be identified. Furthermore, the use of cross-sectional data for selected years limits the possibility of fully assessing the long-term effects of innovation activity.

In future research, it would be appropriate to apply econometric methods enabling a more detailed identification of causal relationships. It would also be worthwhile to take into account enterprise heterogeneity in terms of size, industry and form of ownership and to include additional determinants of financial position in the analyses, such as the level of research and development expenditure, access to sources of finance, and the quality of the institutional environment. This would allow a more comprehensive explanation of the mechanisms shaping the relationship between enterprise innovativeness and financial standing.

The findings contribute to research on regional variation in enterprise innovativeness and financial condition and indicate that effectively supporting regional competitiveness requires both the development of innovation potential and the creation of conditions conducive to the stable financial development of enterprises.

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