

Sectoral Differences in the Perception of Dominant Production Resources in Relation to Efficiency

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Abstract. *The company's management's view of the importance of the main sources of growth may not correspond to how effectively these sources are actually used in reality. Current scientific literature lacks this perspective, which links management's subjective view of the main sources of company growth with objective quantitative analysis. The paper focuses on differences in the perception of sources of business growth by company management and the assessment of the effectiveness of the main sources of business growth. Empirical analysis of 153 companies in the Czech Republic in four sectors (IT services, trade and services, heavy manufacturing, light manufacturing). Primary data was obtained through a questionnaire survey and from financial statements from the Orbis database. The analysis focused not only on the perception of the main source in the context of the effectiveness of its use, but also in terms of profitability. The analysis revealed sectoral differences. In the service sector, compared to industry, the link between labor productivity and the dominant source of business growth, which according to management is human resources, was confirmed. A detailed analysis of manufacturing showed that the average values of productivity indicators vary depending on the perception of the dominant production factor. In industry, it was found that if companies have a higher production capacity of fixed assets, resource productivity also improves. On the contrary, all indicators of production factor efficiency (labor productivity, capital productivity, resource productivity) show a very weak and rather negative correlation with profitability indicators. The analysis found that the view of company management on the sources of company growth does not always correspond to how effectively these sources are used in companies, especially in fixed assets, technology, or materials. The article reveals a discrepancy between management's perception of the main sources of growth and their actual effectiveness.*

Keywords: production resources, efficiency, business model, companies, sectors.

Introduction

Management decision-making is the process of choosing strategies and measures that determine the direction of the company, the allocation of resources, and the response to changes in the environment. These decisions are closely linked to business models, because the chosen model determines how the organization will create value, generate revenue, and maintain competitiveness. This perspective has a significant impact on the use of a particular business model in a company. The relationship between a business model and its corporate performance depends

on the basic situation with available resources. From the perspective of alternative use, start-up companies, which can use resources differently from older companies, may be a significant factor today (Ruthensteiner & Leitner, 2025).

From the perspective of the company's management itself, a subjective factor plays a significant role in assessing which resources are key to the company's growth. On the other hand, even after ensuring long-term competitiveness, the company must monitor the effectiveness of the resources used. In addition, it provides a basis for strategic decision-making for the long-term development of the company. The effective use of production factors leads to higher profitability in the long term. In the economic reality of a company, it is often necessary to align the business model focused on the use of specific resources (managerial behaviour) with the performance of companies in a market economy (Guluma, 2021). The aim of this paper is to define the differences in the perception of company resources by management and the assessment of the effectiveness of the main sources of company growth.

Literature review

Efficiency (productivity) is an economic variable that indicates the effectiveness of production factors (inputs) used in the production of the final product (output) in a company. The most important and most frequently used sub-productivity is labour productivity. Labour productivity measures the amount of output per unit of labour (time or labour costs). A business study by Wannakraij and Velu (2021), which examines the impact of business model innovation on business efficiency, points to a positive impact on productivity growth (labour productivity and total factor productivity). This trend is also confirmed by a business study by Gautam et al. (2025) focused on small and medium-sized enterprises, which identified that innovation in the business model leads to increased resilience, productivity, and profitability of enterprises.

Productivity can be divided into single-factor productivity (capital and labour) and total factor productivity (TFP). Single-factor productivity (SFP) is defined as output per unit of input. TFP represents an increase in total production, which exceeds the increase in production caused by an increase in the amount of inputs involved in this production (Dvoulety & Blažková, 2021). Pressure from society and governments for environmentally and socially responsible behaviour by businesses has led to efforts by businesses to use the state's natural resources more economically and efficiently.

In recent years, companies have been increasingly addressing the productivity of natural resources as raw material and energy prices rise and environmental regulations tighten. Companies are trying to use less materials, water, and energy for the same output to reduce costs, risks, and environmental impacts. At the same time, higher resource productivity gives them a competitive advantage, a better reputation, and long-term stability. The main indicator for assessing the efficiency of natural resource use in businesses is resource productivity. This indicator can be defined as the ratio of output to material input. The indicator can be measured at both the macro and micro levels. At the business level, sales can be used as output and materials as input. An empirical analysis by Hu and Zhao (2024) analysing the relationship between companies' environmental performance and their profitability found that more efficient use of resources leads to higher profitability.

Business Models and Utilized Resources

Business models, as described by Wirtz et al. (2016), are widely used in practice. Arend (2013) and Massa et al. (2017) state that a business model represents a description of how value is created

for customers. A simplified, pragmatic definition of business models is offered by Osterwalder (2012), according to whom a business model represents the way a firm buys and sells goods and services and generates profit. Lanzolla and Markides (2021) emphasize the analytical function of business models and their use in formulating corporate strategy as well as in explaining differences in firm performance. Empirical studies confirm a causal relationship between the configuration of a business model—i.e., how a firm creates, delivers, and captures value—and its competitive advantage and financial performance (Clauss, 2017; Latifi et al., 2021; Xue et al., 2019). Based on these approaches, a business model can be understood as the way a firm creates value for customers and transforms it into profit.

One of the elements examined within business models is resources and their utilization (Fakieh et al., 2022; Sibalija et al., 2021; Teece, 2018; Weerakoon & Kodithuwakku, 2023). Resources represent the fundamental inputs of business models and subsequent value creation, and their combination, intensity of use, and relative importance may differ significantly across firms (Desyllas et al., 2022; Rai et al., 2021).

From a theoretical perspective, resources can be considered key determinants of firms' competitiveness and performance, particularly within the resource-based view of the firm (Barney, 1991; Beamish & Chakravarty, 2021; D'Oria et al., 2021). Core assumptions of this concept include the achievement of long-term competitive advantage derived from unique and difficult-to-imitate resources (Barney, 1991; Bromiley & Rau, 2016; D'Oria et al., 2021; Komakech et al., 2025). The resource-based view constitutes the theoretical framework of this article.

Although there is extensive literature addressing the efficiency of individual factors of production, less attention has been paid to firms' subjective perceptions of their importance and the relationship of these perceptions to measurable performance indicators (Bergmann et al., 2017; Vij & Bedi, 2016). This perspective is, however, important for the application of business models, as it reflects a firm's strategic priorities and the way resources are integrated into the value creation process. The present article builds on this research gap and aims to examine whether firms that declare labour, capital, or material inputs as their most important resource also achieve higher productivity of the corresponding factor of production, and whether this higher productivity subsequently translates into higher profitability.

Methodology

The empirical analysis focused on companies in the Czech Republic. Companies were examined not only using financial indicators (data from the Orbis firm's database), but also on the basis of a questionnaire survey for companies from selected sectors most commonly represented in the economy (services, manufacturing). The questionnaire survey is described as follows: Primary data was obtained through a questionnaire conducted via telephone with managers of Czech companies at the beginning of 2025. The responses were recorded and then processed statistically. Respondents answered closed questions that captured what type of customer the company considers key and what communication channels it uses in practice. The total number of valid responses was 153 companies. The questionnaire survey focused on the main production resources that managers consider dominant. Based on the managers' responses, the authors focused their attention on companies that consider human resources to be the dominant production factor (group 1) and those that consider the technologies used together with material resources to be the dominant production factor (group 2). Companies providing agricultural services (34 entities) were excluded from the sample of companies surveyed, as they reported different results, which would not allow

for a factually relevant and methodologically correct comparison with other entities. The nature of these companies' activities is specific and influenced by subsidy programs.

Companies in the manufacturing industry were further divided according to their predominant economic activity into companies in light manufacturing (25.0, 25.6, 25.7) and companies in heavy manufacturing (25.62).

For companies classified in this way, indicators measuring the efficiency of production factors were analysed: Labour productivity (ratio of operating revenues to employee costs), Resource productivity (ratio of operating revenues to material costs), Capital productivity (ratio of Operating revenues and Tangible and Intangible fixed Assets), and indicators measuring profitability: Return on Assets - ROA (ratio of Earning before interest, taxis and depreciation – EBITDA and Total Assets), Return on Sales – ROS (ratio of Operating profit/loss and Operating revenues). In order to eliminate extraordinary effects, the values for individual indicators were considered as average values for the years 2023–2020. The numbers of entities considered are shown in Table 1.

Table 1. Numbers of analysed companies

Sector	Number of economic entities
IT services	22
Group 1	14
Group 2	8
Light manufacturing	31
Group 1	23
Group 2	8
Trade and services	15
Group 1	8
Group 2	7
Heavy manufacturing	51
Group 1	23
Group 2	28
Total	119

Source: Authors' own research.

The analysis first focused on the examination of the difference of levels of enterprise resource productivity, respectively enterprise labour productivity namely among sector of economic activity and among the perception of dominant production resources. The hypotheses of the level of resource productivity or labour productivity in companies are verified by using the ANOVA test (Montgomery & Runger, 2010). This test allows us to test the effect of multiple factors on a variable.

The variable explained were the resource productivity and the labour productivity, the explanatory variables referred to as factors were the perception of dominant production resources (labour, technology) and sector of economic activity (IT services, Light manufacturing, Heavy manufacturing, Trade and services). We test the hypothesis about the so-called main effects of factors, i.e., hypotheses that the effects of all levels of a given factor (regardless of the level of the second factor) are zero.

H: $X_1 = X_2 = \dots = X_k = 0$, X (groups of companies according to the perception of dominant production resources) = 1,2.

respectively H: $Y_1 = Y_2 = \dots = Y_k = 0$, Y (groups of companies by sector of economic activity) = 1, ...,4.

The hypothesis is that the magnitude of the effect of a change in the level of one factor does not depend on the specific level of the other factor. The normality assumption (Shapiro-Wilk test) and the homogeneity of variance assumption (Levene's test for homogeneity of variances) were tested before ANOVA was performed. In addition, the dependence of production factor efficiency indicators and profitability indicators was examined for manufacturing companies using correlation analysis.

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Results and discussions

The average labour productivity was determined for companies classified by sector (economic activity) and by their perception of the importance of production factors for their business activities (Figure 1). Group 1 consists of enterprises that consider human resources to be the dominant production factor, and Group 2 considers the dominant production factor to be the technologies used together with material resources.

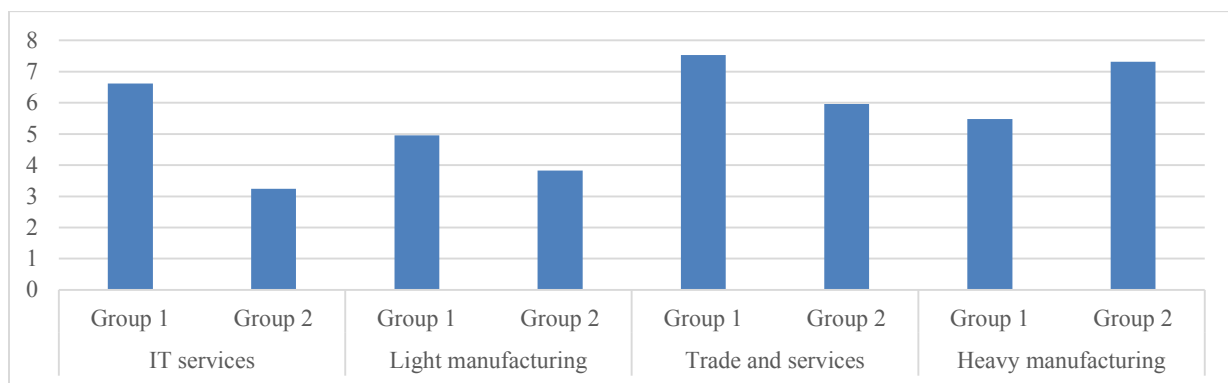


Figure 1. Average labour productivity

Source: Authors' own research.

Figure 1 suggests that the highest labour productivity is in the service sector (IT services, trade, and services), specifically in companies that consider labour to be the dominant factor. In these companies, human resources are a top priority in terms of both recruiting high-quality workers and caring for employees. In manufacturing companies, it is clear that, in addition to human resources, technology is very important, without which labour productivity cannot be increased. In heavy manufacturing companies, if the emphasis is on technology, labour productivity is higher. Higher labour productivity should also affect the profitability of the company, although a number of other factors also influence profitability. Figure 2 reflects the level of average labour productivity according to the above classifications.

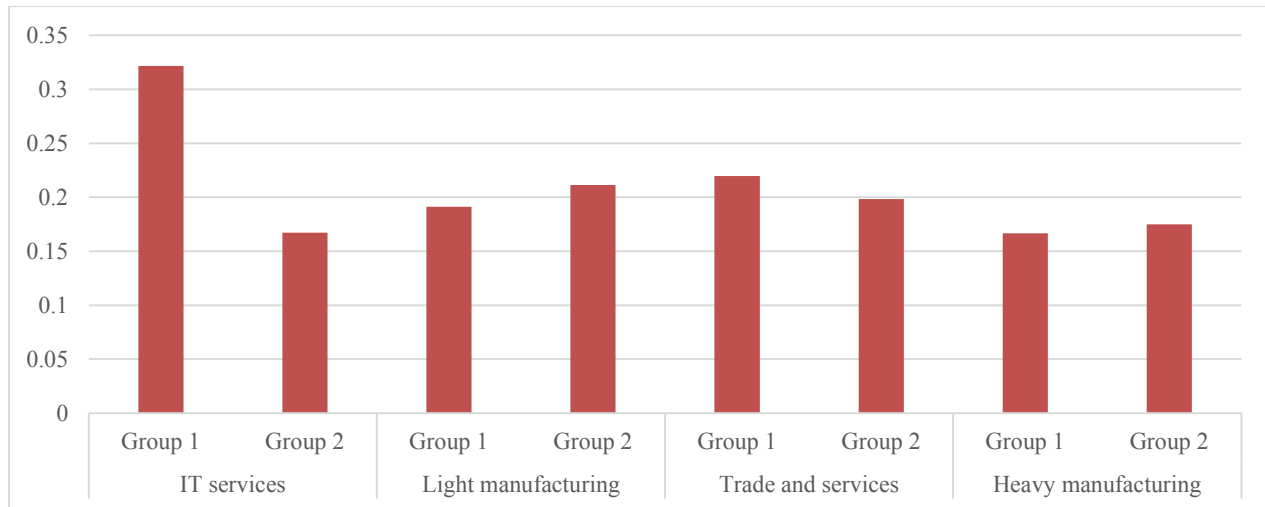


Figure 2. Average Return on Assets

Source: Authors' own research

Service companies, particularly in the IT services sector, where the emphasis is on labour, achieve high levels of labour productivity and the highest levels of return on assets. In manufacturing companies, there are no significant differences between groups of companies in terms of the perceived dominant production factor.

The ANOVA test was used to verify the hypothesis (over 95% reliability) of whether there are any statistical differences in companies' resource productivity, respective labour productivity in the sector (IT services, trade and services, light manufacturing, heavy manufacturing) and in the perception of dominant production resources (labour, technology). The value of the test statistic and p-value states (Table 2). This method analyses the impact of two factors on examined dependent variable resource productivity, respectively labour productivity. The Sector factor (Figure 3) has a statistically significant effect on the set of dependent variables as a whole; the relatively low value of Wilks' λ (≈ 0.49) indicates a moderately strong to strong multivariate effect, i.e., the values of the dependent variables differ significantly between sectors. The second factor analysed, the perception of dominant production resources (Figure 4), did not show a statistically significant effect on the set of dependent variables.

Table 2. The results of multivariate significance tests

	Test	Value	F	Effect (SV)	(SV)	p
Abs. member	Wilks	0.130532	174.8495	4	105.0000	0.000000
Sector	Wilks	0.494004	7.0786	12	278.0954	0.000000
The perception of dominant production resources	Wilks	0.948244	1.4327	4	105.0000	0.228308

Source: Authors' own research.

This method analyses the impact of two factors on the examined dependent variable resource productivity, respectively labour productivity. The Sector factor (Figure 3) has a statistically significant effect on the set of dependent variables as a whole; the relatively low value of Wilks' λ (≈ 0.49) indicates a moderately strong to strong multivariate effect, i.e., the values of the dependent variables differ significantly between sectors.

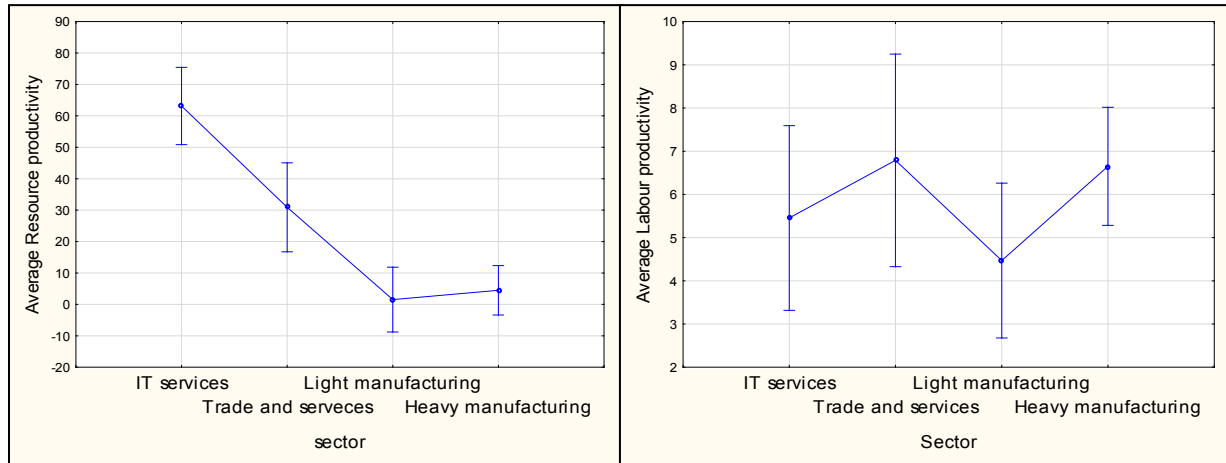


Figure 3. The impact of the sector factor on average resource productivity and average labour productivity

Source: Authors' own research.

The second factor analysed, the perception of dominant production resources (Figure 4), did not show a statistically significant effect on the set of dependent variables.

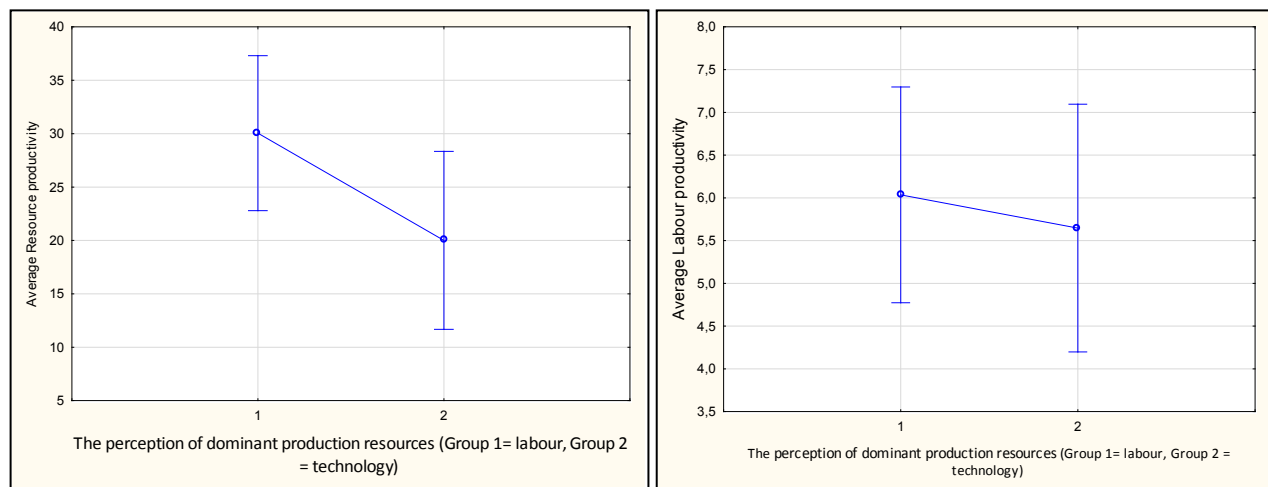


Figure 4. The influence of the perception of dominant production resources on average resource productivity and average labour productivity

Source: Authors' own research.

The following detailed analysis focused on manufacturing, broken down into light and heavy manufacturing. Both production factor efficiency indicators and profitability indicators were examined. The reason for this is that production and material resources, including energy use, are very important for the manufacturing industry. Table 3 illustrates the indicators examined for the sample of companies.

Table 3. Selected indicators for companies in the manufacturing industry

	Average labour productivity in CZK	Average resource productivity in CZK	Average capital productivity in CZK	Average ROS (%)	Average ROA (%)
Light manufacturing	4.66	3.89	13.31	8.68	19.65
Group 1	4.96	4.37	11.6	8.25	19.13
Group 2	3.82	2.58	18.23	9.90	21.14
Heavy manufacturing	6.49	3.78	8.76	7.74	17.11
Group 1	5.48	2.76	7.55	7.90	16.65
Group 2	7.32	4.55	9.75	7.61	17.49

Source: Authors' own research.

Table 3 shows that average labour productivity values are higher in heavy manufacturing, especially in companies where technology and material resources are perceived as the most important production factor (group 2 has CZK 7.32 in operating revenues per CZK 1 in employee costs). There is no apparent difference in average resource productivity between light and heavy manufacturing. However, once again, resource productivity is highest in heavy manufacturing companies that perceive technology and material resources as the dominant factor (group 2 has CZK 4.55 in operating revenues per CZK 1 in material costs). Capital productivity is significantly higher in light manufacturing companies, especially those that consider technology and material resources to be the dominant production factor (group 2 companies generate CZK 18.23 in operating revenues per CZK 1 in fixed assets). The average values of this indicator vary depending on the perception of the dominant production factor. In terms of profitability, light manufacturing companies report slightly higher values for ROA and ROS indicators, but there are no noticeable differences according to the classification of companies in terms of the perceived importance of one of the production factors.

Table 4. Correlation of selected variables in manufacturing

	Average in CZK	Standard deviation	Average labour productivity	Average resource productivity	Average ROA	Average ROS	Average capital productivity
Average Labour productivity	5.896	4.445	1.000	0.127	-0.152	-0.236	0.198
Average resource productivity	5.976	15.888	0.127	1.000	0.150	-0.100	0.270
Average ROA	0.191	0.072	-0.152	0.150	1.000	0.426	0.101
Average ROS	0.084	0.045	-0.236	-0.100	0.426	1.000	-0.157
Average capital productivity	12.152	17.453	0.198	0.270	0.101	-0.157	1.000

Source: Authors' own research.

Notes: marked correlations are significant at the level of $p < .05000$.

Table 4 presents the results of a correlation analysis between selected indicators of productivity and profitability in manufacturing. The correlation coefficient values show mostly weak to moderately strong linear relationships between the analysed variables. The moderately strong positive correlation between ROA and ROS ($r = 0.426$) is statistically significant, which is logical since these indicators are interrelated. This means that companies with higher return on assets also achieve higher return on sales. The relationships between production factor efficiency

indicators and profitability are rather weak and predominantly negative. A statistically significant, albeit relatively weak, relationship has been demonstrated between capital profitability and resource productivity. This means that as capital productivity increases, so does resource productivity. Higher production capacity of fixed assets improves the ratio of operating revenues to material consumption, i.e., there are savings in material and energy resources. All indicators of production factor efficiency (labour productivity, capital productivity, resource productivity) show very weak and rather negative correlations with profitability indicators. This may indicate that higher values of production factor efficiency indicators do not automatically lead to higher profitability. This may be due to higher wage costs and capital intensity, which increase costs and thus affect profitability. Low correlation coefficients suggest that the efficient use of resources has only a limited impact on profitability. The performance of companies in the manufacturing sector is influenced by many factors, and indicators of production factor efficiency are only some of them. combination of factors and that productivity indicators alone are not sufficient predictors of profitability.

Conclusion

The management's view of the importance of the main sources of company growth may not correspond to how effectively these sources are actually used in reality. This paper focuses on differences in the perception of resources and the assessment of the effectiveness of the main sources of business growth. It is therefore an assessment of the appropriate business model in the context of resource efficiency (Weerakoon & Kodithuwakku, 2023). Attention must also be paid to the business sector, which can play a significant role in assessing effectiveness. Different results can be expected in the service sector and in the industrial sector. The empirical analysis was based on a questionnaire survey of 153 companies in the Czech Republic in four sectors (IT services, trade and services, heavy manufacturing, light manufacturing). The questionnaire survey focused on the main production resources that managers consider dominant and subsequently assessed the efficiency of these resources.

On the one hand, human resources (Group 1) and, on the other hand, technology and material resources (Group 2) were identified as the dominant production factors on which business managers focus their attention. The analysis showed that although the average values of productivity indicators differ between groups, no statistically significant difference was found. The study by Ulises and José (2024) highlighted the significant influence of human resource management. The analysis found a positive relationship between human factor management and company productivity.

A detailed analysis was carried out for manufacturing companies, divided into light and heavy manufacturing. In companies where technology and material resources are perceived as the most important production factor, heavy manufacturing has higher average labour productivity values and, at the same time, higher resource productivity values. Meanwhile, companies in light manufacturing that perceive technology and material resources as the most important production factor have significantly higher capital productivity. A detailed analysis of manufacturing showed that the average values of productivity indicators vary depending on the perception of the dominant production factor. It was found that if companies have a higher production capacity of fixed assets, resource productivity also improves.

On the contrary, all indicators of production factor efficiency (labour productivity, capital productivity, resource productivity) show a very weak and rather negative correlation with profitability indicators. This means that productivity indicators alone are not sufficient predictors

of profitability. In addition to production factor efficiency indicators, other factors also influence a company's profitability. This conclusion is confirmed by a study by Pompei and Venturini (2022), which found that labour productivity may not directly affect ROA, but may have an impact through other factors such as human capital. Each group of indicators (efficiency of production factors and profitability) shows a different aspect of a company's performance. The main limitations of this paper include the relatively small sample of companies and its focus solely on the Czech Republic. Further research should focus in more detail on individual sectors and other factors.

The main contribution of the paper consists in empirically demonstrating the difference between managers' perceptions of dominant sources of growth and their actual effectiveness, with an emphasis on the role of the industry. The article thus contributes to the discussion on the suitability of business models by emphasizing the need for a comprehensive view of resource efficiency and profitability as complementary areas of business performance.

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