QUALITY MANAGEMENT AND CONTROLLING IN MANUFACTURING ENTERPRISES VERSUS THEIR PERFORMANCE

Potkany M., Stasiak-Betlejewska R., Gejdos P., Grofcikova J.*

Abstract: The application of principles of quality management and controlling has already been established in the business environment with the potential of numerous benefits and performance impacts. The aim of the research is to identify the scale of use of both management approaches in Slovak manufacturing enterprises and evaluate their perception in terms of capital structure vs. performance. The research aim prioritizes a strategic approach to quality and controlling that enables to identify its real understanding and application in the contemporary enterprises management. In research period 2022-23, a questionnaire survey and structured interviews were conducted to obtain 356 responses from managers of manufacturing enterprises. The Chi-square goodness-of-fit test was applied for the representativeness test. In addition, the 95% interval estimate of relative frequencies and the two-sample test were applied for hypothesis testing. The study identified a statistically significant difference between the capital structure of manufacturing enterprises and their overall understanding and practical application of quality management and controlling methods or approaches, in relation to the performance measured by the ROS indicator.

Key words: controlling, quality management, performance, manufacturing enterprises

DOI: 10.17512/pjms.2024.30.2.13

Article history:
Received August 20, 2024; *Revised* November 02, 2024*; Accepted* November 12, 2024

Introduction

The current flexible market environment and changing customer demands create increasing demands on businesses to effectively adapt and predict changes in

Marek Potkany, prof. PhD., Technical University in Zvolen, Department of Economics, Management and Business, Slovakia;
✉ Corresponding author**:** potkany@tuzvo.sk,
ORCID: 0000-0002-7477-6157
Renata Stasiak-Betlejewska, Ing., PhD., Czestochowa University of Technology, Department of Production Engineering and Safety, Poland;
✉ email: renata.stasiak-betlejewska@wz.pcz.pl
ORCID: 0000-0001-8713-237X
Pavol Gejdos Ing., PhD., Technical University in Zvolen, Department of Economics, Management and Business, Slovakia;
✉ email: gejdosp@tuzvo.sk,
ORCID: 0000-0001-6521-9730
Janka Grofčíková Ing., PhD., Matej Bel University in Banská Bystrica, Department of Finance and Accounting, Slovakia;
✉ email: janka.grofcikova@umb.sk,
ORCID: 0000-0001-5050-4715

conditions and preferences. Given the highly competitive business environment and unforeseen changes in cost structures, as well as quality product requirements, it is essential to continuously monitor the situation and be prepared to adapt to market demands. This adaptation must be complemented by a focus on the product innovation and also by utilizing various quality management practices (QMPs) and controlling approaches. Practices and methods of quality management not only focus on product quality and meeting customer requirements but also aim to build a comprehensive quality system across the entire production chain. According to the results of several studies (Sahoo, 2021; Gambi et al., 2021), modern quality management today prioritizes a strategic approach to quality, process automation, and digitization, as well as enhancing customer satisfaction, which have become key elements in ensuring consistent quality of products and services. Many studies declare that quality is one of the tools that companies use to fulfill their strategy and increase their competitiveness (Liu et al., 2020; Kotásková and Rozsa, 2018; Benčiková et al., 2021; Olszewska 2017). The fundamental impact on a company's performance is also influenced by controlling principles. Controlling in its complex and modern essence is understood as a subsystem of business management that is future-oriented. Its task is to assist leadership and responsible individuals in directing the company's operations (Tworek and Sałamacha, 2019; Stańczyk and Stuss, 2018, Bogdanovská 2007). Controlling is not only focused on retroactively tracking items such as costs and revenues but primarily looks toward the future and manage the profit. The practical application of controlling is evident across various domains, notably in finance (Wang and Shailer, 2022; Kozarevic and Vehabovic, 2020), investments (Agarwal and Chaudhry, 2022; Sekścińska et al., 2022), cost management (Behúnová et al., 2022; Nowak, 2016), personnel management (Voynarenko et al., 2020; Nowak et al., 2020), and quality assurance (Nowosielski, 2018; Dahlgaard et al., 2019). The above-mentioned studies often analyzed QMPs or controlling portfolios with a focus on specific concepts, methods, or approaches, without a more comprehensive view of their utilization across the entire industrial sector or their potential impact on business performance. Therefore, a research gap can be identified in this area. The main goal of this study is to find answers to the following research question (RQ): Are the capital structure of companies and performance indicators distinguished by specific classification factors that differentiate the practical utilization of quality management and controlling approaches in the industrial sector of companies in Slovakia?

Literature Review

The quality management in manufacturing enterprises is an integral part of the organizational management, focusing on the optimizing work procedures and production processes to achieve acceptable final product quality and support further growth and development of the company. The International Standard ISO 9001:2015 specifies requirements for a quality management system. This standards implementation declares the ability of businesses to consistently provide products

and services that meet customer requirements, regulations, and compliance frameworks. In the study, Janeková and Onofrejová (2016) concluded that a quality management system helps organizations analyze customer requirements, define processes, and maintain control over them, thereby contributing to improving quality and efficiency. Existing scientific studies primarily concentrate on assessing the prevalence of Quality Management Practices (QMPs) across different industries, but often lack a comprehensive examination of their impact on performance. For instance, Garza-Reyes et al. (2015) highlighted QMPs' scale in the automotive industry, while Attia (2016) explored this issue in the textile industry. Researchers like Marcysiak (2021), Kelić et al. (2020), and Mira et al. (2018) analyzed the services sector. Agarwal et al. (2013) delved into determinants of QMPs in manufacturing enterprises, and Gambi et al. (2021) conducted similar research. However, these studies often focused on specific concepts or methods, lacking a holistic view of QMPs' utilization and impact across the entire industrial sector.

Assessing the performance of a business still significantly relies on the quality management. Numerous researchers highlight the significance of quality and its beneficial impacts on business performance (Parast and Safari, 2022; Rey Sánchez et al. 2022; Potjanajaruwit, 2021; Stacho et al. 2021). Within the quality management, companies have a relatively broad portfolio of quality management methods, tools and concepts that can be presented as a scale of QMPs (Santos et al., 2021; Kuhn et al., 2018). Based on the results of the study by Potkany et al. (2022b), it can be concluded that industrial companies utilize the following QMPs): TQM, Six Sigma method, Process management approach, Kaizen philosophy, ISO standards 9000, basic quality management tools and also preventive methods of quality control. Based on the results of the study by Potkany et al. (2022a), it can be concluded that industrial companies utilize the following controlling approaches: compilation and control of plan (production, revenues and costs) compared to a plan/reality, control of the quality and quantity of production, control of cost consumption, flexible pricing of products, use of benchmarking principles, and also budgeting. The above-mentioned tools, methods, and approaches have become the subject of research in identifying a broader range of their potential utilization.

Controlling in a business context is a key tool for effective management and achieving goals. Its essence lies in providing objective reporting and evaluation of all economic events within the company. The primary role of controlling is supervising the achievement of predefined results and identifying deviations that occur during business operations The modern concept of controlling focuses on establishing secondary coordination of management by creating and connecting functional systems for information gathering, planning, and control (Eschenbach, 2004). The array of controlling tools, methods, and approaches play a crucial role. Their application is significantly influenced by numerous factors, including the investor's know-how, the managers' experience and skills, the industry's specialization, potentially the size of the business, and particularly the philosophy of practical implementation and expectations from the controlling concept. In the past,

several studies have been carried out aiming to outline the controlling tools used in manufacturing companies. Current research studies in the field of controlling cover a wide range of areas. The use of controlling in the business sphere is relatively broad and its essence can be perceived diversely by enterprises of different sectors and sizes (Potkány et al. 2022a; Alzoubi 2022; Neves 2020; Kontesa 2015; Aliu 2010; Frank 2009). Studies investigating the influence of controlling on a company's financial performance (Bieńkowska et al., 2021; Tworek et al., 2019; Sedliačiková et al., 2019; Eschenbach, 2004) demonstrate that a positive correlation between controlling and financial gains is not merely highly anticipated, but also actual. The application of controlling in logistic processes was analyzed by Behúnová et al. (2020) and Ulewicz et al. (2014), and Dobrovič et al. (2019), who examined this issue in the context of quality controlling. The domain of quality controlling was also addressed in the works of Shen and Chen (2020), Bieńkowska (2021), and Baldi (2020). Studies that highlight the potential of human resource controlling are also intriguing. The impact of the professional direction path on the concept of human resource controlling was investigated by Nowak et al. (2020), Benčiková et al. (2021), and Slinták (2015). Numerous factors can impact the utilization and understanding of the core of quality management and controlling. An analysis of EU businesses indicates that the form of ownership plays a substantial role in the variations in business performance (Fitza and Tihanyi, 2017). The effect of the form of ownership structure is explored in various research domains in management theory. For instance, the banking sector and its performance (Mishra and Ramana, 2018); the field of corporate social responsibility (Dewi and Wirawati, 2021; Voinea et al., 2019); and the area of Industry 4.0 (Rossini et al., 2019).

In the context of the above literature review, no studies were found relating to the analysis of the relationship between the use of quality management and controlling and the company's performance.

The original contribution of this research lies in identifying the use of controlling and QMPs in manufacturing enterprises and the possible relationships with capital structure or business performance, as well as in revealing potential differences in the analysed industrial sectors.

Research Methodology

The goal of the research is to identify a portfolio of the use of available QMPs and controlling approaches in Slovak manufacturing enterprises and subsequent evaluation of perception of nature these concepts in terms of capital structure of companies and relation to the performance. Primary quantitative research (at the platform google.form) and structured interviews was he major research method using a traditional questionnaire technique. The data collection timeframe for the questionnaire survey was conducted between 2022-2023, supplemented by structured telephone interviews with managers of selected industrial companies in Slovakia at the end of 2023. Questionnaire consisted of questions of a selective nature (company size, industry area, duration of market activity, capital structure)

and especially questions aimed at the range of practical use methods of quality management and controlling and determining the performance indicator - ROS. The enterprises were divided according to NACE codes (European Industry-standard classification system, section C Manufacturing) into industries. At the time of the survey sample, according to the Statistical Office of the Slovak Republic, the basic population size was 2,504 enterprises.
Given the population size of manufacturing enterprises (N = 2,504) and a desired error margin of 0.05 (E), the Yamane Taro formula (Richterová et al. 2007) was used to establish a minimum sample size of 345 manufacturing enterprises:

$$n = \frac{N}{1+N \cdot E^2} \quad (1)$$

To verify the representativeness, the Chi-square goodness-of-fit test was utilized, that is, to examine significant disparities between the research and target population. This test was also employed for contingency testing. The determination of dependence between two qualitative variables hinges on the observed and anticipated frequencies (Kohler, 1988):

$$\chi^2 = \sum \frac{(f_0 - f_e)^2}{f_e} \quad (2)$$

As part of the methodological procedure, the confidence interval for a population proportion was also applied. An interval estimate of a population proportion π is constructed around a sample proportion p according to the formula (Lind, 2020):

$$p - z_{\frac{\alpha}{2}} \cdot \sqrt{\frac{p(1-p)}{n}} < \pi < p + z_{\frac{\alpha}{2}} \cdot \sqrt{\frac{p(1-p)}{n}} \quad (3)$$

using 95% of confidence and sample size n.

Data processing was performed using STATISTICA 12 software. A significance level of 0.05 was selected as a decision criterion when testing hypotheses, to ensure comparability with analogous studies.
Based on the previous literature review, the following hypotheses (H1, H2) were formulated:
H1: It is assumed that there is a difference between the capital structure of manufacturing enterprises and the perception of the essence of quality management and controlling.
H2: It is assumed that manufacturing enterprises that underutilize the essence of quality management and controlling reach a lower level of performance indicated by Return on Sales.

Research Results and Discussion

The literature review highlights the fundamental aspects of quality management and control, focusing on how various tools, methods, and practices are applied across numerous industries. Nonetheless, there is a lack of comprehensive research

analyzing how the comprehension and implementation of these particular management strategies affect performance. This gap in research underpins the growing interest in this topic within the context of Slovak manufacturing businesses. The study incorporated a final data set consisting of 356 manufacturing enterprises, which serves as a representative sample of the target population with a 5% margin of error. The industry representativeness of the research sample was verified using the Chi-square goodness-of-fit test. Based on the results of the goodness-of-fit test ($\chi 2 = 6.48$; df = 15; p=0.971), the distribution of enterprises by manufacturing sectors in the research sample does not differ significantly from that in the population of manufacturing enterprises in Slovakia. The sample set meets the conditions of representativeness.

Table 1. Representation of manufacturing sectors in the research sample

Sector	NACE 10-11	NACE 13	NACE 15	NACE 16	NACE 17	NACE 20	NACE 21	NACE 22
% of population	12.03	7.11	1.76	4.91	2.00	2.08	0,68	8.99
Sector	NACE 23	NACE 24- 25	NACE 26	NACE 27	NACE 28	NACE 29	NACE 31	NACE 32*
% of population	4.55	23.88	2.84	6.03	8.63	6.23	3.31	4.71

Note:* + NACE 5-9, 18-19

Initially, it was essential to determine how controlling methods and QMPs were practically applied, considering their extent of utilization among the surveyed entities and in accordance with the NACE industry classification. In light of the fundamental concept of controlling in German-speaking regions, which emphasizes reporting and costs, the research examined the following controlling instruments and methods: compilation and control of plan (production, revenues and costs) compared to a plan/reality, control of the quality and quantity of production, control of cost consumption, flexible pricing of products, use of benchmarking principles, and also budgeting. In the case of QMPs, the practical use of the following approaches was investigated: Total Quality Management, Six Sigma method, Process management approach, Kaizen philosophy, ISO standards 9000, Basic quality management tools

and Preventive methods of quality control. If a company independently uses three or more controlling tools and quality management approaches, it can be observed that there is a wider scale of practical application. Such a level is considered to be adequate utilization of quality management and controlling. This assumption is preserved at the testing for H1 hypothesis

Within the scope of all 356 surveyed manufacturing companies, a minority of them (46.06%) utilize a wider range of controlling tools, and it was also identified that 174 of these companies use a wider scale of quality management methods and tools, representing a share of 48.88%. The distribution according to specific sectors categorized by NACE codes is illustrated in Figure 1.

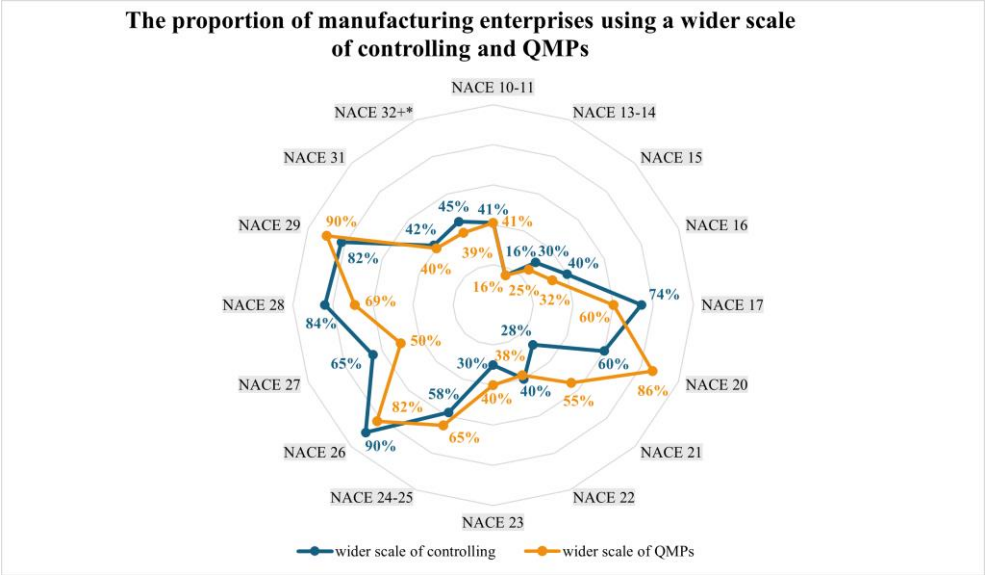

Figure 1: Distribution of manufacturing companies utilizing controlling and QMPs in the study sample
Source: Own elaboration

The research results confirmed that the use of quality management and controlling tools, methods and practices are more common in large and partially also medium-sized enterprises, with sectors with higher added value prevailing within the classification of sectors: manufacture of motor vehicles (NACE 29), manufacture of computer products (NACE 26), manufacture of machinery and equipment (NACE 28), manufacture of paper and paper products (NACE 17) and manufactur of chemicals (NACE 20). In the given industries, a broad range of utilization of both management practices has been identified, which can be considered an adequate perception of the essence of quality management and controlling. The impact of capital structure on the perception of this essence remains questionable. Researchers conducted a sample survey to evaluate the significance of variations in the adoption

of broader quality management and controlling practices among Slovak manufacturing enterprises. The study specifically examined enterprises with both domestic capital (DC) and foreign capital (FC). The results of hypothesis testing (H1, Table 2) indicated a significant difference (p=0.000). Notably, foreign investment enterprises more frequently implement the broader essence of controlling, as evidenced by the 95% confidence interval estimate presented in Table 3.

Table 2. Test about the difference between two population proportions: domestic vs foreign capital structure

p_1-point estimate of population proportion (DC)	n_1-sample size (DC)	p_2-poin estimate of population proportion (FC)	n_2-sample size (FC)	*u*-test	*p*-value
30.37%	196	59.62%	160	-5.90	0.000

The results of the interval estimate suggest that while in enterprises with a predominance of domestic capital, the proportion fully utilizing quality management and controlling management ranges from 24% to 39%, in enterprises with foreign capital, the interval estimate is between 52% and 69%. Based on the above, we can confirm the H1 hypothesis that there exists a difference between the capital structure of manufacturing enterprises and their perception of the essence of quality management and controlling.

Table 3. Interval estimates - Comparison of Quality Management and Controlling Proportions by Capital Structure

95% confidence interval for population DC		95% confidence interval for population FC	
marginal lower limit	marginal upper limit	marginal lower limit	marginal upper limit
24%	39%	52%	69%

Numerous studies have extensively examined the relationship between a company's capital structure and its perception or utilization of controlling (Xu, 2023; Wardana and Gunarsih, 2022; Olaniyi et al., 2015). These studies explore how capital structure decisions affect corporate performance, governance, and financial reporting, with a specific focus on controlling mechanisms within companies. Additionally, numerous studies have extensively examined the relationship between a company's capital structure and its use of quality

management tools (Gallego and Gutiérrez Ramírez, 2021; Wu et al., 2020; Donate et al., 2019). These studies investigate how financial decisions related to capital structure impact the implementation and effectiveness of quality management practices. Authors confirm through research that effectively managing these managerial concepts in practice can significantly enhance firms' performance and innovative capabilities1. Among Slovak manufacturing companies, those with foreign capital tend to be more successful in most industries. These companies have brought proven know-how in management, utilizing principles of controlling, quality management, and other concepts. The results of the specific research in Slovak manufacturing companies confirm this, but the same fact is also supported by findings from other authors in various countries worldwide (Zandi et al., 2020; Dokulil et al., 2018; Wnuk-Pel and Christauskas, 2018). Within management approaches for controlling and quality management compliance with the principles of Supply Chain Management (SCM) is important. Cost management, emphasis on customer preferences and environmental sustainability principles are closely connected. The SCM framework was covered in detail in the study by Hariharasudan et al. (2021). Muangmee et al. (2022) demonstrated that SCM practices and operations adopted by small and medium enterprises in Thailand, Slovakia, and Poland were invariant. The environmental sustainability elements in SCM, as well as the social aspects of sustainability, have positively influenced these practices in all countries. Research results from the study by Kot et al. (2018) demonstrated similar involvement in the implementation of the SCM concept in Poland and Kazakhstan, with significant differences in some areas, such as cost reduction and a focus on end customers.

The second hypothesis (H2) concerned the potential effect of using the essence of the quality management and controlling in manufacturing enterprises, where it was assumed that enterprises that underutilize the essence of controlling and quality management reach a lower level of performance indicated by Return on Sales. In Table 4, a two-dimensional distribution of surveyed enterprises is illustrated, based on two characteristics – a wider scale of the essence of controlling and QMPs versus the ROS level. The reported values of ROS fall within the range of negative values or up to 2.5%, from 2.6% to 5%, and more than 5%.

In Table 5, the existence of a relationship between the utilization of quality management and controlling principles compared to the achieved ROS level was analysed. This relationship was tested using Pearson's Chi-squared test, and a significant correlation ($p = 0.001$) was identified between the tested variables. Based on the value of the contingency coefficient and Cramer's V (0.46), this correlation was assessed as moderately strong. Among individual manufacturing sectors, NACE 29, 21, and 20 achieve an ROS level exceeding 5%. NACE 26 and NACE 27 fall into the above-average ROS range of 2.6% to 5%. Conversely, negative ROS levels were predominantly reported by sectors NACE 13, 14, and 22. Thus, hypothesis H2 was confirmed.

Table 4. Contingency table – observed frequencies for various combinations of essence of controlling and level of ROS

Essence of controlling /QMPs	ROS indicator				Total
	Negative value	Up to 2.5%	From 2.6% to 5%	More than 5%	
the essence is not fully utilized	25	127	24	6	182
	7.02%	35.67%	6.74%	1.69%	51.12 %
the essence is fully utilized	23	40	60	51	174
	6.46%	11.24%	16.85%	14.33%	48.88 %
Total	48	167	84	57	356
	13.48%	46.91%	23.59%	16.02%	100.00 %

Table 5. Results of Pearson chi-square test

Pearson's Chi-squared test	degree of freedom	p-value	contingency coefficient	Cramer's V
80.32	3	0.001	0.42	0.46

The provision of effective controlling systems is a key factor to increase the profitability and performance of enterprises. The following studies investigate the impact of controlling on the profitability of enterprises and provide similar conclusions to the presented study (Huang, 2022; Erdoğan, 2019; Bienkowska, 2020; Tworek et al., 2019). Quality management is also a key factor in improving business performance. The positive impact of quality management systems on business performance was reported in the study by Kumar et al. (2018). Further research has shown that the certification of QMPs according to ISO 9001 positively affects the operational and market performance of Serbian enterprises, whereas the intensity of the impact depends on the size of the company and the type of industry (Milovanović et al., 2021). Furthermore, a study (Ali et al., 2017) indicated that total quality management practices positively impact the performance measurement of managerial leadership, employee relations, supplier quality management, product design, and data quality and reporting.

A certain shortcoming of the above research studies is the absence of identification of the range of use of managerial approaches of quality management and controlling comprehensively on the whole manufacturing industry. It can be

therefore stated that the contribution of the study is its comprehensive view of the manufacturing industry, but especially the identification of certain causal factors (capital structure of enterprises and the portfolio range of the use of management approaches based on controlling and quality management) affecting the performance of manufacturing enterprises.

Conclusion

The research question addressed whether the capital structure of manufacturing enterprises and the indicators of their performance present certain classification factors distinguishing the practical use of the essence and approaches of quality management and controlling in the area of manufacturing enterprises in Slovakia. Based on the research results, it can be concluded that the capital structure of manufacturing enterprises significantly influences the range of use of quality management and controlling principles. Enterprises with foreign capital participation use tools and methods of controlling and QMPs to a greater extent. So it is possible to identify the difference between the capital structure of manufacturing enterprises and the perception of the essence of quality management and controlling, which confirmed hypothesis H1. The hypothesis H2 regarding the potential impact of the nature of both managerial practices on business performance was also confirmed. The manufacturing enterprises that underutilize the essence quality management and controlling reach a lower level of performance indicated by Return on Sales. This statement can also be presented reciprocally.

There is considerable space for an even wider use of both management approaches and an increase in the performance and overall efficiency of Slovak manufacturing enterprises. Potential benefits can also be expected in the reduction of costs of non-conforming products, increased product quality, process success, but also increased customer satisfaction and clearer cost reporting leading to a more flexible decision-making style. In particular, readiness for crisis or unexpected situations of turbulent inflationary effects can contribute to greater adaptation and agility of enterprises with regard to developing their competitiveness. The limiting factor of this paper is the implementation of the research study in the conditions of Slovak manufacturing enterprises. This is also the reason why the results cannot be generalized to the broader regional and business environment. Nevertheless, the findings presented allow for a comparison with related research conducted in the broader European Union business context. Further research aims to explore the use of controlling mechanisms in the Visegrad region countries and central and eastern European countries, particularly in the Czech Republic, Poland, Hungary, Slovenia, Croatia and Serbia. Future research directions could also delve more deeply into identifying barriers related to the low-level implementation of QMPs and controlling in small and medium-sized enterprises. Additionally, it aims to compare the expected versus actual benefits of both managerial practices, considering other business segments.

Acknowledgments

This work was supported by the Scientific Grant Agency of the Slovak Republic within the projects: VEGA no. 1/0093/23

References

Aliu, N. O., (2010). Effect of capital structure on the performance of quoted manufacturing firms in Nigeria. Unpublished Thesis. Ahmadu Bello University.

Alzoubi, H. M., In'airat, M. and Ahmed, G., (2022). Investigating the impact of total quality management practices and Six Sigma processes to enhance the quality and reduce the cost of quality: the case of Dubai. *International journal of business excellence*, *27*(1), 94-109.

Agarwal, A., Chaudhry, N., (2022). Foreign controlling shareholders and corporate investment. *Journal of International Financial Markets Institutions and Money*, *80*(3).

Agarwal, R., Green, R., Brown, P. J., Tan, H. and Randhawa, K., (2013). Determinants of quality management practices: An empirical study of New Zealand manufacturing firms. *International Journal of Production Economics*, *142*(1), 130-145.

Ali, F., Jain, R., Ali, L. and Munir, K., (2017). The effects of quality practices on the performance measurement of business management. *Journal of Advanced Management Science*, *5*(6), 440-444.

Attia, A. M., (2016). Effect of quality management on supply chain and organisational performance in the Egyptian textile industry. *International Journal of Business Performance Management*, *17*(2), 198-222.

Baldi, N., (2020). Management of innovations in public governance: Quality management system, management controlling and internal auditing appropriation. *Marketing and Management of Innovations*, *11*(2), 95-107.

Behúnová, A., Knapčíková, L. and Behún, M., (2020). Logistics of controlling implementation in conditions of manufacturing enterprise. *Acta Logistica – International Scientific Journal about Logistica*, *7*(1), 23-29.

Behúnová, A., Knapciková, L. and Behún, M., (2022). *Company controlling.* Berlin. Springer.

Benčiková, D., Malá, D., Sedliačiková, M., Drábek, J. and Kropil R., (2021). Assessment of cultural intelligence as a prerequisite to development of an enterprise within the contemporary global corporate environment. *Ekonomický časopis, 69*(1), 88-109.

Bieńkowska, A., (2020). Controlling effectiveness model - Empirical research results regarding the influence of controlling on organizational performance. *Engineering Management in Production and Services*, *12*(3), 28-42.

Bieńkowska, A., (2021). Controlling quality and effectiveness: Controlling effectiveness model. In *Introducing the Controlling Effectiveness Model* (p. Introducing the Controlling Effectiveness Model, 2021). Switzerland: Springer International Publishing AG.

Bogdanovská, G., Floreková, L. and Terpak, J. (2007). Quality management in services – requirements of the standard ISO 9001:2000 and the model CAF. *Acta Montanistica Slovaca*, *12*(1), 62-68.

Dahlgaard, J. J., Reyes, L., Chen, C. K. and Dahlgaard-Park, S. M., (2019). Evolution and future of total quality management: management control and organisational learning. *Total Quality Management and Business Excellence*, *30*(sup1), S1-S16.

Dewi, N. P. Y. K., Wirawati, N. G. P., (2021). The influence of share ownership structure and company size on corporate social responsibility disclosures. *American Journal of Humanities and Social Sciences Research*, *5*(2), 67-73.

Dobrovič, J., Kmeco, L., Gallo, P. and Gallo jr., P., (2019). Implications of the Model EFQM as a strategic management tool in practice: A case of Slovak tourism sector. *Journal of Tourism and Services*, *10*(18), 47-62.

Dokulil, J., Popesko, B. and Dvorský, J., (2020). The budgeting processes of Czech companies: The role of the ownership structure and foreign capital. *Oeconomia Copernicana*, *11*(4), 779-798.

Donate, M., Ruiz-Monterrubio, E., Pablo, J. and Peña, I., (2019). Total Quality Management and high-performance work systems for social capital development: Effects on company innovation capabilities. *Journal of Intellectual Capital*, *21*(1), 87-114.

Erdoğan, M., (2019). Assessment of the internal control system in the accommodation firm and its relation to performance. In D. Batabyal and D. Das (Eds.), *Global Trends, Practices, and Challenges in Contemporary Tourism and Hospitality Management*, 211-232. IGI Global.

Eschenbach, R., (2004). *Controlling*. Praha. ASPI Publishing.

Fitza, M., Tihanyi, L., (2017). How much does ownership form matter? *Strategic Management Journal*, *38*(3), 2726-2743.

Frank, M. Z., Goyal, V. K., (2009). Capital structure decisions: which factors are reliably important? *Financial management*, *38*(1), 1-37.

Gallego, J., Ramírez, L., (2021). Quality certification and firm performance. The mediation of human capital. *International Journal of Productivity and Performance Management*, *72*(3), 710-729.

Gambi, L. D. N., Lizarelli, F. L., Junior, A. R. R. and Boer, H., (2021). The impact of quality management practices on innovation: An empirical research study of Brazilian manufacturing companies. *Benchmarking: An International Journal*, *28*(3), 1059-1082.

Garza-Reyes, J. A., Ates, E. M. and Kumar, V., (2015). Measuring lean readiness through the understanding of quality practices in the Turkish automotive suppliers industry. *International Journal of Productivity and Performance Management*, *64*(8), 1092-1112.

Hariharasudan, A., Kot, S. and Sangeetha, J., (2021). The decades of research on SCM and itsadvancements: a comprehensive framework. *Acta Logistica, 8*(4), 455-477.

Huang, P., (2022). Research on the influence of internal control quality on enterprise performance. *Frontiers in Humanities and Social Sciences*, *9*(2),47-55.

Janeková, J., Onofrejová, D., 2016. Quality assessment of production in industrial company. In *Trends and Innovative Approaches in Business Processes "2016", 19.*

Kelić, I., Erceg, A. and Čandrlić Dankoš, I., (2020). Increasing tourism competitiveness: Connecting blue and green Croatia. *Journal of Tourism and Services*, *20*(11), 132-149.

Kohler, H., (1988). *Statistics for business and economics*. Scott Foresman. Wesley.

Kontesa, M. (2015). Capital structure, profitability, and firm value. Whats new. Research *Journal of Finance and Accounting*, *6*(20), 185-192.

Kot, S. O., Onyusheva, I. and Grondys, K., (2018). Supply chain management in SMEs: evidence from Poland and Kazakhstan. *Engineering Management in Production and Services*, *10*(3),23-36.

Kotaskova, A., Rozsa, Z., (2018). The impact of selected factors on the quality of business environment assessment in the Czech Republic and the Slovak Republic. *International Journal of Entrepreneurial Knowledge*, *6*(2), 71-80.

Kozarevic, E., Vehaovic, Z., (2020). Effects of implementing (financial) controlling on business performances of small and medium-sized enterprises in the Federal state of Bavaria. *Eurasian Journal of Business and Management*, *8*(1), 70-84.

Kuhn, M., Schaefer, F. and Otten, H., (2018). Process complexity as a future challenge – a quality management perspective. *The TQM Journal*, *30*(6), 701-716.

Kumar, P., Maiti, J. and Gunasekaran, A., (2018). Impact of quality management systems on firm performance. *International Journal of Quality and Reliability Management*, *35*(5), 1034-1059.

Lind, D. A., (2020). *Statistical techniques in business and economics*. McGraw-Hill.

Liu, J. M., Borazon, E. Q. and Santamaria, J. G. O., (2021). Antecedents of quality performance in the Philippine micro, small, and medium hospitality sector. *Asia Pacific Business Review*, *27*(4), 559-582.

Marcysiak, A., (2021). Customer service quality management on the courier services market. *Entrepreneurship and Sustainability Issues*, *9*(1), 190-203.

Milovanovic, V., Janosevic, S. and Paunović, M., (2021). Quality management and business performance of Serbian companies. *Ekonomika Preduzeca*, *69*(5-6), 345-356.

Mira, M. R. C., Moura, A. F. A. and Mónico, L. D. S. (2018). A new measure of the quality of tourism product. *Journal of Tourism and Services*, *9*(17).

Mishra, B. K., Ramana, L. V., (2018). Does ownership structure influence bank performance?: Evidence from an Emerging Economy. *Journal of Emerging Market Finance*, *17*(2), 282-297.

Muangmee, C., Kassakorn, N., Khalid, B., Bacik, R. and Kot, S., (2022). Evaluating Competitiveness in the Supply Chain Management of Small and Medium Scale Enterprises. *Journal of Competitiveness*, *14*(2), 93-112.

Neves, M. E., Serrasqueiro, Z., Dias, A. and Hermano, C., (2020). Capital structure decisions in a period of economic intervention: Empirical evidence of Portuguese companies with panel data. *International Journal of Accounting and Information Management*, 28(3), 465-495.

Nowak, E., (2016). Cost control and its role in controlling company operation. *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu*, *441*, 125-133.

Nowak, M., Nesterak, J. and Kowalski, M., (2020). *Controlling personalny w praktyce przedsiębiorstw działających w Polsce*. CeDeWu.

Nowosielski, K., (2018). *Efficiency of controlling processes. Being. Manifestations. Determinants.* Wrocław. Wyd. UE we Wrocławiu.

Olaniyi, T., Elelu, M. and Abdulsalam, T., (2015). Impact of capital structure on corporate performance: A pre and post crisis evaluation of selected companies in US. *International Journal of Approximate Reasoning*, *2*(8), 1-20.

Olszewska, Anna M., (2017), Research issues undertaken within quality management – the overview of selected literature, *Engineering Management in Production and Services*, 9 (1) 74-83.

Parast, M. M., Safari, A., (2022). Enhancing the quality and competitiveness of small businesses: A pooled cross-sectional analysis. *International Journal of Production Economics*, *246*, 108410.

Potjanajaruwit, P., (2021). TQM knowledge management and analysis of SMEs in Thailand. *Polish Journal of Management Studies, 24(2),* 386-397.

Potkány, M., Hašková, S., Lesníková, P. and Schmidtová, J., (2022a). Perception of essence of controlling and its use in manufacturing enterprises in time of crisis: Does controlling fulfill its essence? *Journal of Business Economics and Management*, *23*(4), 957-976.

Potkany, M., Zavadsky, J., Hlawiczka, R., Gejdos, P. and Schmidtova, J., (2022a). Quality management practices in manufacturing enterprises in the context of their performance. *Journal of Competitiveness*, *14*(2).

Rey Sánchez, S. P., Garivay Torres De Salinas, F. D. M., Jacha Rojas, J. P. and Malpartida Gutiérrez, J. N., (2022). Industry 4.0 and business quality management. *Revista Venezolana de Gerencia*, *27*(97), 289-298.

Richterová, K., Labská, H., Klepochová, D., Vokounová, D. and Žák, Š., (2000). *Kapitoly z marketingového výskumu.* Bratislava. Ekonóm.

Rossini, M., Costa, F., Portioli-Staudacher, A. and Tortorella, G. L., (2019). Industry 4.0 and lean production: An empirical study. *IFAC-PapersOnLine*, *52*(13), 42-47.

Sahoo, S., (2021). Process quality management and operational performance: Exploring the role of learning and development orientation. *International Journal of Quality and Reliability Management*, *39*(5), 1190-1208.

Santos, G., Sá, J. C., Félix, M. J., Barreto, L., Carvalho, F., Doiro, M., Zgodavová, K. and Stefanovi´c, M., (2021). New needed quality management skills for quality managers 4.0. *Sustainability*, *13*(11), 6149.

Sedliačiková, M., Stroková, Z., Drábek, J. and Malá, D., (2019). Controlling implementation: What are the benefits and barriers for employees of wood processing enterprises? *Acta Facultatis Xylologiae Zvolen*, *61*(2), 163-173.

Sekścińska, K., Rudzinska-Wojciechowska, J. and Jaworska, D., (2021). Self-control and investment choices. *Journal of Behavioral Decision Makin*g, *34*(5), 691-705.

Shen, B., Chen, C., (2020). Quality management in outsourced global fashion supply chains: An exploratory case study. Production Planning and Control, *31*(9), 757-769.

Slinták, K., (2015). Cultural reversal: Why does obedience lose with the initiative. *International Journal of Entrepreneurial Knowledge*, *3*(2), 59-75.

Stacho, Z., Stachová, K., Varečková, Ľ. and Matúšová, J. G. (2021), Direction of businesses operating in Slovakia to develop key managerial competencies, *Production Engineering Archives*, 27(4), 291-295

Stańczyk, I., Stuss, M. M., (2018). Personnel controlling – Human capital management. Results of selected company listed on Warsaw stock exchange. *International Journal of Contemporary Management*, *17*(3), 241-260.

Tworek, K., Bieńkowska, A. and Zabłocka-Kluczka, A., (2019). Coexistence of business continuity management and controlling: Controlling use as a moderator of relation between BCM maturity and organizational results. *International Journal of Industrial Engineering and Management*, *10*(1), 57-68.

Tworek, K., Sałamacha, A., (2019). CRM influence on organizational performance – the moderating role of IT reliability. *Engineering Management in Production and Services*, *11*(3), 96-105.

Ulewicz, R., Vasko, A. and Klimecka-Tatar, D., (2014). Controlling of the logistic processes. *Production Engineering Archives*, *3*(2), 26-30.

Voinea, C. L., Fratostiteanu, C. and Romein, B., (2019). The influence of governance and ownership on CSR practices in Romania. *European Journal of Sustainable Development*, *8*(3), 313.

Voynarenko, M., Vedernikov, M., Volianska-Savchuk, L., Zelena, M., Bazaliyska, N. and Baksalova, O., (2020). Modeling of controlling activity as an instrument of influence on motivation in the personnel management system of industrial enterprises. In *10th International Conference on Advanced Computer Information Technologies (ACIT.)*, 601-606.

Wang, K., Shailer, G., (2022). Multiple performance criteria for government-controlled firms. *International Review of Economics and Finance*, *79*, 75-96.

Wardana, O., Gunarsih, T., (2022). The effect of capital structure on company value with corporate governance as a moderating variable. *Jurnal Ilmu Manajemen and Ekonomika*, *14*(1), 9-16.

Wnuk-Pel, T., Christauskas, C., (2018). Analysis of operational budgeting practices in Polish and Lithuanian companies. *Transformations in Business and Economics*, *17*(3), 102-124.

Wu, R., Huo, B., Yu, Y. and Zhang, Z., (2020). Quality and green management for operational and environmental performance: Relational capital in supply chain management. *International Journal of Logistics Research and Applications*, *25*(4-5), 471-492.

Xu, L., (2023). Analysis of four capital structure theories and financing choice of Chinese-listed companies. *Advances in Economics, Management and Political Sciences*, *22*, 215-219.

Zandi, G., Singh, J., Mohamad, S. and Ehsanullah, S., (2020). Ownership structure and firm performance. *International Journal of Financial Research*, *11*(2), 293-300.

ZARZĄDZANIE JAKOŚCIĄ I CONTROLLING W PRZEDSIĘBIORSTWACH PRODUKCYJNYCH W KONTEKŚCIE ICH WYNIKÓW

Streszczenie: Stosowanie zasad zarządzania jakością i controllingu jest już ugruntowane w środowisku biznesowym, oferując potencjał licznych korzyści i wpływu na wyniki działalności. Celem badania jest zidentyfikowanie skali wykorzystania obu podejść zarządczych w słowackich przedsiębiorstwach produkcyjnych oraz ocena ich postrzegania w kontekście struktury kapitałowej w odniesieniu do wyników. Badanie koncentruje się na strategicznym podejściu do zarządzania jakością i controllingu, które pozwala zidentyfikować rzeczywiste rozumienie i zastosowanie tych metod w zarządzaniu współczesnymi przedsiębiorstwami. W okresie badawczym 2022–2023 przeprowadzono ankietę oraz wywiady strukturyzowane, uzyskując 356 odpowiedzi od menedżerów przedsiębiorstw produkcyjnych. W celu sprawdzenia reprezentatywności zastosowano test dopasowania Chi-kwadrat. Ponadto zastosowano 95-procentowy przedział ufności dla częstości względnych oraz test dwupróbkowy do weryfikacji hipotez. Badanie wykazało istotną statystycznie różnicę pomiędzy strukturą kapitałową przedsiębiorstw produkcyjnych a ich ogólnym zrozumieniem i praktycznym zastosowaniem metod lub podejść związanych z zarządzaniem jakością i controllingiem, w odniesieniu do wyników mierzonych wskaźnikiem ROS.

Słowa kluczowe: controlling, zarządzanie jakością, wyniki, przedsiębiorstwa produkcyjne