

# “Strategic management controlling system and its importance for SMEs in the EU”

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# STRATEGIC MANAGEMENT CONTROLLING SYSTEM AND ITS IMPORTANCE FOR SMEs IN THE EU

## Abstract

The current hyper-competitive environment offers many great opportunities for small and medium-sized businesses (SMEs), but on the other hand, this business environment is also hazardous. SMEs are a significant economic power and employer in the European Union. Their competitiveness and long-term stability are a crucial factor for European cohesion and economic growth. The research aim is to design a strategic management controlling system that should be implemented to SMEs and be useful for their long-term future development. The study was conducted in 2017–2020 based on data from 403 SMEs. The PAPI method was used to collect data. The implications between defined variables controlling, ROA, turnover, financial analysis, and strategic management were explained, and the results obtained from an in-depth analysis were indicated. The research was concluded by a model of strategic management controlling system tested by experimental in-practice implementation on SMEs and verified. The model and the research findings are suitable for business practice and should support the long-term stability and development of SMEs.

## Keywords

performance, competitiveness, stability, ROA, turnover,  
model, correlation, business

## JEL Classification

M10, M21, M30, M40

## INTRODUCTION

Today's contemporary business environment is very volatile. Many factors influence a company's business activities. It is presumed that not all companies (especially SMEs) are ready to analyze their business environment (for many reasons – financial, personnel, organizational). The lack of detailed and correct information leads to bad managerial decisions and causes the decline of many companies. A strategic management controlling system could be one of the essential tools for helping managers to identify business strengths, weaknesses, threats and opportunities.

The current hyper-competitive environment, the emerging technology of Industry 4.0, innovation, the intense competition of large and multinational enterprises and the interconnectedness of these entities and areas have a significant impact on the SME sector (Písař & Tomášková, 2019). Similar conclusions are drawn by Moef, Pellerin, Lamouri, Tamayo-Giraldo, and Barbaray (2017), who point to the long-term technology usage and its importance for SMEs. European SMEs are fundamental forces that create the backbone of the EU economy. They also develop socio-cultural society in regions. Their position in the economy and society is irreplaceable. SME is one of the most prestigious groups of employers and innovators in the EU. SMEs employed 93 million people, accounting for 67% of total employment in the EU-28 non-financial business sector and generating 57% of value-added in

the EU-28 non-financial business sector. Almost all (93%) of the SMEs were micro SMEs employing less than ten persons (European Commission, 2018). SMEs are an essential part of the economy. Their financial stability and managing the growth of business value are crucial to increasing the competitiveness of SMEs, the cohesion of the European Union and its economy. According to Belás, Dvorský, Kubálek, and Smrčka (2018), SMEs are the cornerstones of any economy. Other authors also describe and agree on SMEs as an essential factor for economic development. Ključnikov and Belás (2016) state that SMEs are a necessary aspect of every market economy. Gama and Geraldes (2012) comment on the importance of SMEs for the European economy, stability and cohesion.

SMEs will also consider their production capacity, domestic market conditions and financial and non-financial performance as crucial drivers for growth. It can be said that variables such as assets, management perceptions, market knowledge, risk perceptions, international networks and competitiveness have had a positive impact on the competitiveness of small and medium-sized enterprises. In general, SMEs also need to include competitive factors such as potential entrants, alternative products or services, potential buyers and suppliers, as well as recognizing industry rivals at the specified location (Afonina, 2015). It is important to note that business strategy is essential not only for the competitiveness of an enterprise at a given period, but also for determining an opportunity of future improvement of the company's position on the market and expanding the scope of its activities. Asenkerschbaumer (2012), Buchholz (2013), and Krystek (2012) also consider the importance of strategic management for the development of SMEs.

## 1. LITERATURE REVIEW

Many authors discuss the topic of this paper (e.g., Benedic, 2015; Laval, 2018). They focus on the issues of business strategies and controlling at SMEs. What is important is that authors emphasize the importance of controlling and business planning and recognize their importance as crucial for the future. Business strategy is the way how to support SMEs' competitiveness and long-term stability. Business strategy is directly related to competitiveness (Sachitra, 2016). Controlling as a tool for helping the management to manage processes is also recommended by Benedic (2015). One of the main aims of the implementation of a business strategy is to create a competitive advantage of a company. According to Sachitra (2016), the term 'competitiveness' refers to a comparative measure between companies within an industry or its external environment, which is closely related to the presence of competitive advantage.

Iyugun (2018) emphasizes that in order to maintain its functioning in the intensively competitive conditions, a company should have a distinct and clear strategic position. The company's strategy should create an opportunity to offer value that is different from its competitors and to provide many benefits. According to Písař and Havlíček (2018), to main-

tain its functioning in the intensively competitive conditions, a company should have a distinct and clear strategic position. Controlling should guide the development of the company's business strategies and the recognition of competition practices. Competition strategies are characterized as the whole decisions and behaviors that enhance competition superiority of a company by creating value for the clients in a particular market (Doğan, 2016).

Furthermore, the literature suggests that coordinating and linking business strategy and controlling lead to better organizational performance. Efficient coordination between a company's business strategy and controlling ensures that the company's activities are directed towards those areas that are strategically important for the company's success (Jamil, 2018). All aspects of the conceptual model should be taken into account to evaluate profitability at the company level. Productivity is a metric that captures all aspects of the competition exposed and the competitive potential of a product (Porter, 2004).

Modern controlling must meet the requirements of Industry 4.0 and aim the company to achieve a flexible organizational structure. To this end, Safar, Sopko, Bednar, and Poklemba (2018) state that the process of globalization and the 4th Industrial Revolution force researchers to look

for new flexible business-organizational structures. According to Jo et al. (2017), Industry 4.0 can be divided into two essential areas. The first area consists of a combination of rapidly evolving technology environments such as IoT, Internet of Services (IoS), cyber-physical systems (CPS), smart objects and Big Data. The second area is characterized by businesses operating in high-cost areas that are interested in finding innovative processes and using technologies to maintain and develop the company's competitiveness. Process management and its creative activities using modern tools, social networks, and communication are the key drivers of SMEs (Goller & Bessant, 2017, p. 3). In the context of symbiotic with auditing, a conclusion is made on the modern controlling problematics (Vitezić & Vitezić, 2015). Zaušková, Bobovnický, and Madleňák (2013, p. 256) put the current controlling management system in the long term to consequences with innovations. These conclusions are also verified by Máchová et al. (2015). Bieńkowska, Kral, and Zabłocka-Kluczka (2017) explain strategic controlling as supporting the broadly understood formulation of the organization's strategy and preventing more substantial irregularities during its implementation. Operational controlling in small and medium-sized companies is linked to the fulfillment of the essential short-term targets with a direct impact on the financial indicators. The concept of modern controlling and its advantages as a SMEs' organizational system is also addressed by Kamps (2013, p. 60). This author explains that the typical controlling process is designated to plan, observe and steer enterprise and business processes. According to him, controlling has to generate compressed information to support the management in its decision processes. One of the significant challenges for SMEs in the near future will be the transition to Industry 4.0 and its connection with the necessary implementation of advanced information systems based on the principles of modern controlling.

## 2. AIM AND HYPOTHESES

The aim of the study is to design a strategic management controlling system, which should be implemented in SMEs and be useful for their long-term development in the future.

**Q1:** *Do EU SMEs emphasize strategic management as an integral part of their long-term development?*

**H1:** *An effective operative controlling management system is crucial for strategic management performance and its stability.*

**Q2:** *How should a strategic management system and its development be used to ensure SMEs' stability and competitiveness?*

**H2:** *SMEs that use strategic management performance, operative controlling and financial analysis tools are stable and more competitive in the long term.*

**H3:** *SMEs with a higher level of strategic and controlling management system have on average higher turnover and ROA.*

**H4:** *The controlling operative management system will have a close relationship with strategic management with a minimum value of the Pearson correlation coefficient of 0.7.*

## 3. METHODOLOGY AND DATA SOURCES

The research was based on the EU SME data collected in the period 2017–2019. For the study, SMEs were first chosen by randomized selection from the D-base of the University of Finance and Administration,  $n = 3,805$ . For analysis and model construction, only SMEs with complete data were used. The final research sample  $n = 403$  SMEs. Based on the research results, the following aims, research questions and hypotheses can be answered.

According to Barbu and Alexandru (2011), data were collected using PAPI (Paper Assisted Personal Interviewing) based on the questionnaire. The research was based on a validated questionnaire and personal meeting in the company, and the results were compounded from interviews at SMEs (top management, middle management and blue collars) using the research process based on the approach of Bulmer (2017); Farley and Flota (2017). Other data were obtained from the actual balance

sheets and profit and loss statements. In cases of sociological requesting, a Likert 5-point scale was used. IBM SPSS ver.25 and Microsoft excel made the final processing of data.

### 3.1. Variables examined

Strategic management – assessment scale: 0 = no, 1 = sporadic, 2 = moderate, scheduling regular use and evaluating it at least 2 times during the fiscal year, 3 = high level – the company intensively works on using the strategic management with a focus on achieving the set goals, 4 = optimized level with an emphasis on continuously improving strategic management.

Financial analysis – assessment scale: 0 = no, 1 = sporadic, no feedback, 2 = moderate, regular use at least 1x during the fiscal year, 3 = high level – the company intensively works on using financial analyses management, 4 = optimized level – the company uses financial tools analysis, continuously drives the company to manage value growth and stability of the SME.

Controlling management system – assessment scale: 0 = missing or inadequate, 1 = low level, 2 = moderate level, 3 = exceptional level, including automatic drivers for continuous improvement.

#### 3.1.1. Return on assets (ROA)

$$ROA = \frac{EBIT}{Assets}. \quad (1)$$

Turnover x 1000 in EUR – assessment scale by annual revenue: 0 = (0-199), 1 = (200-399), 2 = (400-999), 3 = (1000-1,999), 4 = (2-3,999), 5 = (4-9,999), 6 = (10-19,999), 7 = (20-39,999), 8 = (> 40,000).

### 3.2. Reliability and correlation analysis

To analyze the reliability of the research data, the method for calculating Cronbach's alpha was used. According to Cronbach (1951), Cronbach's alpha takes values in the interval of 0-1. A small Cronbach's alpha value indicates low reliability of the analyzed data. Usually, a value of 0.7 or higher is interpreted as a high reliability of the data sample examined. Cronbach's alpha is given by:

#### 3.2.1. Cronbach's alpha

$$\alpha = \frac{k}{k-1} \left( 1 - \frac{\sum_{j=1}^k \text{var}(Y_j)}{\text{var}(Y)} \right). \quad (2)$$

Computing of Cronbach's alpha for this type of study has also been verified (Kramer, Mileva, & Kay, 2018, p. 2; Wijazatunga, 2016).

### 3.3. Pearson correlation coefficient

Pearson correlation coefficient will be used to analyze the relationship between variables. According to Tsintsadze, Oniani, and Ghoghoberidze (2018, p. 115) and Wijayatunga (2016), calculating Pearson correlation coefficient will be used (to 0.20, the correlation is negligible, 0.20-0.40 is not a very close correlation, 0.40-0.70 is a moderately tight correlation, 0.70-0.90 is a very close correlation, and more than 0.90 is an extremely close correlation). For the research purpose, the Pearson coefficient test value at minimum 0.4 will be set. If it is 0.7 or higher, the variable will be identified as a key factor.

#### 3.3.1. Pearson correlation coefficient

$$r = \frac{\sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^n (x_i - \bar{x})^2 \sum_{i=1}^n (y_i - \bar{y})^2}}. \quad (3)$$

### 3.4. Stepwise method and model construction

The stepwise method will be used as a final step in building the model for the dependent variable of strategic management. The model will be computed according to the following process. Standardized regression coefficients will be achieved if each dependent and independent variable is standardized. That is, if you subtract the mean and divide by the standard deviation of a variable, you can get them. The formula is below.



### 3.4.1. Regression formula

$$b_{j.std} = b_j \cdot \left( \frac{s_{x_j}}{s_y} \right), \quad (4)$$

where  $s_y$  and  $s_{x_j}$  are the standard deviations for the dependent variable and the corresponding  $j_{th}$  independent variable. To compute the model, the IBM SPSS ver. 25 will be used. For a more detailed study of the process, stepwise analysis follows Darlington and Hayes (2017).

### 3.5. Experimental testing

The conclusions of statistical analyses and the compound model were tested by experimental testing in a randomized sample of SMEs. The reached knowledge was embedded in the company's management, and after 6-12 months, the critical areas in the company were evaluated for changes that arise as a consequence based on the changes made.

## 4. EMPIRICAL RESULTS

The necessary condition given for this study was that all data must pass a significance test at the 5% level.

**Table 1.** Pearson correlation analysis

Source: Research data processed by the authors using SPSS ver.25.

Variables		ROA	Turnover	Financial analysis	Strategic management	Controlling operative
ROA	Pearson Correlation	1	0.292**	0.182**	0.480**	0.470**
	Sig. (2-tailed)		0.000	0.000	0.000	0.000
	n	403	403	403	403	403
Turnover	Pearson Correlation	0.292**	1	0.244**	0.684**	0.625**
	Sig. (2-tailed)	0.000		0.000	0.000	0.000
	n	403	403	403	403	403
Financial analysis	Pearson Correlation	0.182**	0.244**	1	0.353**	0.273**
	Sig. (2-tailed)	0.000	0.000		0.000	0.000
	n	403	403	403	403	403
Strategic management	Pearson Correlation	0.480**	0.684**	0.353**	1	0.790**
	Sig. (2-tailed)	0.000	0.000	0.000		0.000
	n	403	403	403	403	403
Controlling operative	Pearson Correlation	0.470**	0.625**	0.273**	0.790**	1
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	
	n	403	403	403	403	403

Note: \*\* Correlation is significant at the 0.01 level (2-tailed).

### 4.1. Research sample

Cronbach's alpha for five ( $n = 5$ ) variables was computed to test the reliability of the research sample. The value accepted to prove high reliability is taken at the 0.7 level. The result for  $n = 5$  variables is 0.793. The computing of Cronbach's Alpha confirmed that the research sample contains highly reliable data and the research findings also have to be considered highly reliable.

### 4.2. Correlation analysis

Pearson correlation coefficient was computed with an emphasis on the significance test at 5%. Table 1 shows the results.

All data of the variables are tested for significance at the 1% level. In addition, exceptional positive linearity coefficient values were found, and no undesirable multicollinearity of 0.8 or higher was found.

### 4.3. Model construction

Model construction was the next step of statistical analyses. All variables entered the model, which was constructed using the Stepwise forward method. The details of the procedure follow the IBM SPSS manual. The results are in Table 2.

**Table 2.** Model construction, dependent variable Strategic management

Source: Research data processed by the authors using SPSS ver.25.

	Model	Unstandardized coefficients		Standardized coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.475	0.102		40.636	0.000
	Controlling operative	10.091	0.042	0.790	250.797	0.000
2	(Constant)	-0.031	0.113		-0.275	0.783
	Controlling operative	0.730	0.053	0.529	130.852	0.000
	Turnover	0.315	0.035	0.313	80.875	0.000
	ROA	0.193	0.043	0.140	40.492	0.000
3	(Constant)	-0.168	0.115		-10.459	0.145
	Controlling operative	0.703	0.052	0.509	130.506	0.000
	Turnover	0.301	0.035	0.299	80.605	0.000
	ROA	0.182	0.042	0.132	40.311	0.000
	Financial analysis	0.128	0.031	0.117	40.139	0.000

**Table 3.** Model summary

Source: Research data processed by the authors using SPSS ver.25.

Model	R	R-squared	Adjusted R-squared	Std. error of the estimate	Change statistics				
					R-squared change	F change	df1	df2	Sig. F change
1	0.790 <sup>a</sup>	0.624	0.623	0.884	0.624	6650.497	1	401	0.000
2	0.836 <sup>b</sup>	0.699	0.696	0.793	0.075	490.346	2	399	0.000
3	0.843 <sup>c</sup>	0.711	0.708	0.778	0.012	170.129	1	398	0.000

Note: a. Predictors: (Constant), Controlling operative; b. Predictors: (Constant), Controlling operative, ROA, Turnover; c. Predictors: (Constant), Controlling operative, ROA, Turnover, Financial analysis.

Based on Table 2, the model is the following:

$$\begin{aligned} \text{Strategic management} = & 0.168 \cdot \text{Constant} + \\ & +0.703 \cdot \text{Controlling operative} + \\ & +0.301 \cdot \text{Turnover} + 0.182 \cdot \text{ROA} + \\ & +0.128 \cdot \text{Financial analysis}. \end{aligned} \quad (5)$$

The model is significant at the 1% level, and it shows the relationships between the dependent variable Strategic management and explanatory variables including its values. The next step was the finalizing of the model summary (see Table 3).

Based on Table 3, the model explained 71.1% of the analysis data, successfully passed the significance test and the F-test. The statistical analyses should be completed and the results interpreted.

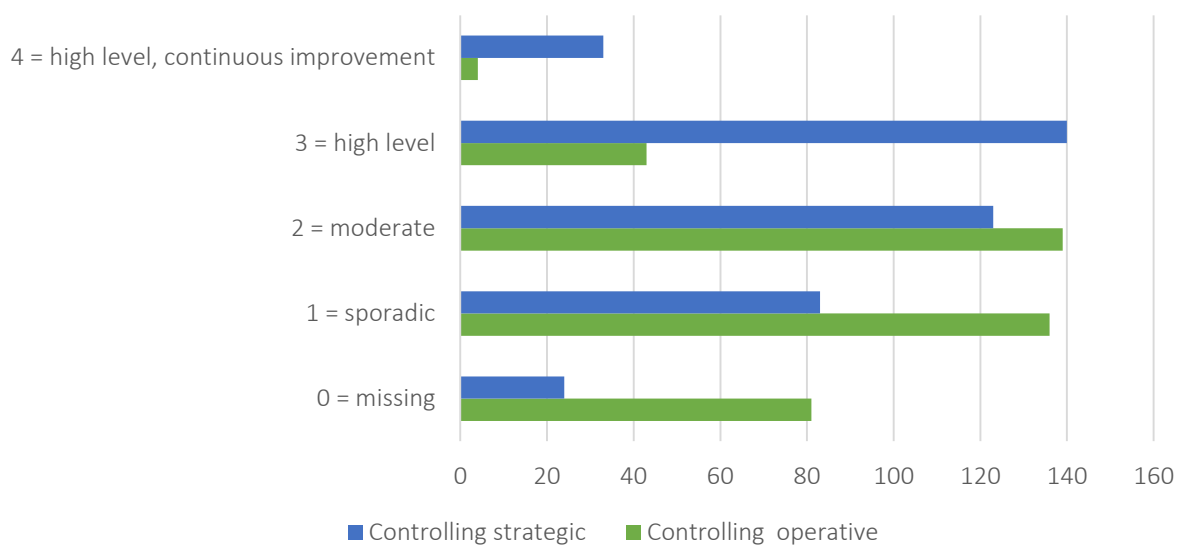
#### 4.4. The analysis result in the interpretation

According to Pearson's correlation, the variable Operative controlling management (see Table 1) on the model with a value of 0.703 shows the importance of the controlling management sys-

tem in the company as a necessary basis for establishing and developing strategic management. Based on the experimental research results, it was proved that SMEs that increased their controlling level in 97% of cases also improved their strategic business decisions. In 98% of SMEs researched, the Operative controlling management system was evaluated by managers on the highest level. Almost 93% of the respondents identified a stable management system based on controlling principles as a necessary condition for the growth and stability of the business. The problem was found in the soft-focus on a strategic controlling management system compared to the operative controlling. The ratio can be seen in Figure 1.

The results should be identified as possible for advanced research with an emphasis on the implementation of the strategic controlling management system. In the current situation, it turned out that operational tasks by 82% overload the responsible management and, unfortunately, do not put emphasis on strategy. This makes the position of SMEs unstable in the future. In any case, based on these findings, hypothesis H1 should be considered proven.

Source: Research data processed by the authors.



**Figure 1.** Operative and strategic controlling implementation at the surveyed SMEs

*Q1: Do EU SMEs emphasize strategic management as an integral part of their long-term development?*

To answer Q1 and the following hypothesis, Pearson's correlation analysis was used to determine the relationship between the controlling management system, the effective strategic planning, SME's stability and competitiveness. It was determined that the correlation value between the Controlling operative management system and Strategic management must be at minimum 0.7 value of the Pearson correlation coefficient. This criterion has been fulfilled and shows the importance of strategic management for the long-term development of SMEs. Based on the experimental testing, it was concluded that SMEs do not focus on strategic management. The typical cause is overloading by operational tasks. The lack of advanced strategic management causes a lack of long-term planning and instability in the competitiveness of SMEs. Based on the analysis of data and the results of experimental testing, the consequences for the controlling management system, the effective strategic planning, SME's stability and competitiveness were proved. Q1 has been answered.

Based on findings in the area of variables: Operative controlling 0.703, Turnover 0.301, ROA 0.182, and Financial analysis 0.128. The model shows how vital these variables are for a function-

al Strategic management system, as well as for the success of any company. An interesting conclusion was drawn when the ROA ratio was compared between SMEs that focus on the financial analysis (according to level 3 and 4 variable definitions) – the average ROA for SMEs was 18,6% compared to the rest of companies – average ROA is 3,9%. Based on these findings, hypothesis H2 should be considered proven.

The model of the dependent variable Strategic management shows the value of 0.301 (Turnover) and 0.182 (ROA). These findings are significant and prove the consequences for the variables researched. An in-depth study of variables found that SMEs that exercise strategic management at levels 3 and 4 report ROA higher than 25% in 81% of cases. Also, the turnover of these SME was evaluated in 85% of cases as higher than 10.000 EUR. The average value of turnover of the 85% of the representatives was 27.652 EUR – the sample  $n = 403$  average value was 8.979 EUR. It can be seen that SMEs with a high strategic controlling management system have an average turnover three times higher. Based on these findings, hypothesis H3 should be considered proven.

The above model shows that the variable of Operative controlling reflects the value of 0.703. This value is fundamental for the strategic management activities of SMEs. Strengthening Operative



Controlling would have a positive effect on strategic management decisions. Experimental testing of the statistical conclusions confirmed that companies with higher use of controlling have higher economic activity and stability. Based on the findings from this exploratory testing, a process of controlling management for SMEs has been proposed. Controlling management for these companies can be described as a set of overarching processes whose goal is to coordinate the entire entity, as well as a set of processes whose task is to analyze historical and current data to make more accurate prognosis and achieve company goals. Having a strategic planning and a controlling management system in a company declares that the company can think in the long term. A company using controlling methods can analyze the current environment and look for opportunities. Operative controlling, which offers many options and connections with strategic planning, is not surprising. Based on the experimental research results, it has been proven that SMEs that strengthened (according to variable definition level 3 and 4) their strategic and controlling management in 84% of cases improved financial situation (financial stability) due to a long-term planning. Hypothesis H4 should be considered proven. Figure 1 shows that SME's management does not put a necessary emphasis on strategy. Based on this, the future research question arises. How to support strategic management in the development of SMEs?

Based on the research results and the confirmed hypothesis, it becomes clear that the controlling management system and strategic management are essential factors for SMEs' stability, growth and competitiveness. Also, it was proven that variables such as ROA and Turnover are vital for the current companies and their future development. The implications of the global competitive environment show how important the vision, mission and well-defined strategic goals are for SMEs to thrive. Strategic management and controlling management offer ideal tools and opportunities for SMEs. Q2 has been answered.

## 5. DISCUSSION

According to Grishunin (2017), the business strategy and controlling are necessary not only for the

competitiveness of an enterprise at a given period, but also for determining an opportunity of the future improvement of the company's position at the market and widening the scope of its activities. These conclusions are also confirmed by Zolkos (2012), who came with similar conclusions and presented the problems of the strategic risk management controlling system. These statements should be concluded by Maqsood, Tareq, and Wikström (2019), Unger, Gemünden, and Aubry (2012), who confirmed the importance of the strategic management controlling system for SMEs and developing business ecosystems.

Shih-Chi and Sharfman (2018) and Bernard, Godard, and Zouaoui (2018) note the importance of the strategic management controlling system and its influence on SMEs' competitiveness and long-term stability in the consequences of the financial stability of an enterprise. Today, business management strategies and controlling must not only take into account developments in the domestic market, but also global competition, which affects the production programs, internal organizational structure, business organization, etc. Both corporate policy and corporate strategy are not static. These theses are verified and developed by Kenari, Naser, and Iranzadeh (2018), who develop enterprise strategy for effective controlling performance-oriented management. They also point out the energy consumption and positive environmental impact of the strategic management controlling system. Stimie and Vlok (2016) support these statements and also point to consequences between the strategic management controlling system, assets management and link them with SMEs' performance and long-term stability. Drechsler and Weißschädel (2018), Heidt, Gerlach, and Buxmann (2019) conclude on the importance of strategic management and its impact on SMEs' long-term stability and development by focusing on current IT technologies. According to Petru, Kramoliš, and Stuchlík (2020), in today's hyper-competitive times, companies are forced to develop their strategic approaches, especially towards customers. Various metrics play an important role in providing data for assessing economic efficiency (Rompho, 2018). In this context, controlling based on valid financial indicators (Gavel, 2016; Moeuf et al., 2017) plays an irreplaceable role.

## CONCLUSION

SMEs play an irreplaceable role in the European Union in terms of the economic development of regions. There is certainly little doubt that the role of SMEs in the European economy is significant, as SMEs have relatively large national economic benefits. The research results show that the strategic management controlling system should be a way to support the development of SMEs in a hyper-competitive environment, increase SMEs' resistance and financial stability. The experimental testing of the resulting model also indicated a low level of long-term SMEs' goals, financial planning and controlling management development. The joint statement of the responsible representatives in SMEs' management should be concluded as follows: "We do not have time to take care of where we will be in three years, because we must work today". In this context and the necessary changes in SMEs' management, controlling plays an irreplaceable role as an instrument of strategic financial management and strategic decision-making.

## RESEARCH LIMITATIONS

These primary limitations of the study are related to the time factor. The PAPI method chosen caused a time-consuming research environment, which is also associated with higher research costs. On the other hand, the PAPI method allows you to collect highly accurate data and most of the other important information that cannot be ordered by other methods. The next limitation is the time needed for delivering research results to business practice. This leads to the fact that research data should be used only for a limited time due to their relevance. The results should not be viewed as a generalization but as a guide to finding new solutions.

## AUTHOR CONTRIBUTIONS

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## REFERENCES

1. Afonina, A. (2015). Strategic management tools and techniques and organisational performance: Findings from the Czech Republic. *Journal of Competitiveness*, 7(3), 19-36. <https://doi.org/10.7441/joc.2015.03.02>
2. Asenkerschbaumer, S. (2012). Strategisches Controlling bei Bosch: Volatilität ist die neue Normalität. *Controlling & Management*, 56(5), 336-340. <http://doi.org/10.1365/s12176-012-0628-7>
3. Barbu, A., & Isaic-Maniu, Al. (2011). Data collection in Romanian market research: a comparison between prices of PAPI, CATI and CAWI. *Management & Marketing*, 6(3), 349-364. Retrieved from [https://www.researchgate.net/publication/227430482\\_DATA\\_COLLECTION\\_IN\\_ROMANIAN\\_MARKET\\_RESEARCH\\_A\\_COMPARISON\\_BETWEEN\\_PRICES\\_OF\\_PAPI\\_CATI\\_AND\\_CAWI](https://www.researchgate.net/publication/227430482_DATA_COLLECTION_IN_ROMANIAN_MARKET_RESEARCH_A_COMPARISON_BETWEEN_PRICES_OF_PAPI_CATI_AND_CAWI)
4. Belás, J., Dvorský, J., Kubálek, J., & Smrčka, L. (2018). Important factors of financial risk in the SME segment. *Journal of International Studies*, 11(1), 80-92. <https://doi.org/10.14254/2071-8330.2018/11-1/6>
5. Benedic, N. O. (2015). The Challenge of Controlling. *International Journal of Industrial Engineering and Management (IJIEM)*, 6(4), 153-163.
6. Bernard, Y., Godard, L., & Zouaoui, M. (2018). The effect of CEOs' turnover on the corporate sustainability performance of French firms: JBE. *Journal of Business Ethics*, 150(4), 1049-1069. <http://dx.doi.org/10.1007/s10551-016-3178-7>
7. Bienkowska, A., Kral, Z., & Zabłocka-Kluczka, A. (2017). Selected functional solutions of strategic controlling in organisations operating in Poland. *Management*, 22(1), 101-118. <http://dx.doi.org/10.2478/management-2018-0008>
8. Buchholz, L. (2013). *Strategisches Controlling* (2 Auflage). Wiesbaden: Springer Fachmedien Wiesbaden. <http://doi.org/10.1007/978-3-8349-4007-0>
9. Bulmer, M. (2017). *Sociological Research Methods*. Routledge, 450 p.
10. Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16(3), 297-334. Retrieved from <https://link.springer.com/article/10.1007/BF02310555>
11. Darlington, R. B., & Hayes, A. F. (2017). *Regression analysis and linear models: concepts, applications, and implementation*. New York: The Guilford Press. Retrieved from <https://www.amazon.com/Regression-Analysis-Linear-Models-Implementation-ebook/dp/B01KTW8MK8>
12. Doğan, E. (2016). The effect of innovation on competitiveness. *Ekonometri ve İstatistik Sayı*, 24, 60-81. <https://dergipark.org.tr/tr/download/article-file/268727>
13. Drechsler, A., & Weißschädel, S. (2018). An IT strategy development framework for small and medium enterprises. *Information Systems and eBusiness Management*, 16(1), 93-124. <http://dx.doi.org/10.1007/s10257-017-0342-2>
14. EUROPEAN COMMISSION. (2019). *SME Performance Review: The annual report (2018)* Brusel, Accessed 01-16-2020 from <https://ec.europa.eu/docsroom/documents/32601/attachments/1/translations/en/renditions/native>
15. Farley, J. E. and Flota, M. (2017). *Sociology*. Routledge.
16. Gama, A. P. M., & Gerales, H. S. A. (2012). Credit risk assessment and the impact of the New Basel Capital Accord on small and medium-sized enterprises: an empirical analysis. *Management Research Review*, 35(8), 727-749. <https://doi.org/10.1108/01409171211247712>
17. Gavel', O. Yu. (2017). Prospects of controlling systems in strategic management. *Finasovaja Analitika*, 10(1), 4-19. <https://doi.org/10.24891/fa.10.1.4>
18. Goller, I., & Bessant, J. (2017). *Creativity for Innovation Management* (332 p.). New York: Routledge.
19. Grishunin, S. V. (2017). Developing the mechanism of qualitative risk assessment in strategic controlling. St. Petersburg State Polytechnical University Journal. *Economics*, 2. <http://dx.doi.org/10.18721/JE.10206> (in Russian)
20. Heidt, M., Gerlach, J. P., & Buxmann, P. (2019). Investigating the security divide between SME and large companies: How SME characteristics influence organisational IT security investments. *Information Systems Frontiers*, 21(6), 1285-1305. <http://dx.doi.org/10.1007/s10796-019-09959-1>
21. Jamil, G. L. (2018). *Handbook of Research on Strategic Innovation Management for Improved Competitive Advantage*. 1. Hershey: IGI Global, p. 712-714.
22. Jo, W. S., Alfnes, E. Strandhagen, J. O., & Logan, R. V. (2017). The fit of industry 4.0 applications in manufacturing logistics: A multiple case study. *Advances in Manufacturing*, 5(4), 344-358. <http://dx.doi.org/10.1007/s40436-017-0200-y>
23. Kamps, T. (2013). *Systematic Chasing for Economic Success: An Innovation Management Approach* (120 p.). Hamburg: Anchor. Retrieved from <https://books.google.com.ua/books?id=W0JWkmAJVNkC&printsec=frontcover&hl=uk#v=onepage&q&cf=false>
24. Kenari, N. K., Naser, F. F., & Iranzadeh, S. (2018). A comprehensive model for energy management strategies in coordination with manufacturing and organisation strategies and its effect on energy management performance. *Cogent Business & Management*, 5(1) <http://dx.doi.org/10.1080/23311975.2018.1463605>
25. Ključnikov, A., & Belás, J. (2016). Approaches of Czech entrepreneurs to debt financing and management of credit risk. Equilibrium. *Journal of Economics and Economic Policy*, 11(2), 343-365. <https://doi.org/10.12775/EQUIL.2016.016>

26. Kramer, R. S., Mileva, M., & Kay, R. L. (2018). Inter-rater agreement in trait judgements from faces. *PLoS One*, 13(8). <https://doi.org/10.1371/journal.pone.0202655>
27. Krystek, U. (2012). Strategisches Controlling – Strategische Controller – Eine Befragung unter Personalberatern zur Rolle der strategischen Controller in der Unternehmenspraxis. *Controlling? Zeitschrift Für Erfolgsorientierte Unternehmenssteuerung*, 24(1), 10-16.
28. Laval, V. (2018). *How to Increase the Value-added of Controlling* (215 p.). Berlin: Gruyter. Retrieved from <https://www.degruyter.com/view/title/535005>
29. Máchová, R. et al. (2015). *Inovačné podnikanie a hodnotenie inovačného potenciálu podnikateľských sietí*. Brno: Tribun EU. Retrieved from [https://sekarl.euba.sk/arl-eu/sk/detail-eu\\_un\\_cat-0213832-Inovacne-podnikanie-a-hodnotenie-inovacneho-potencialu-podnikatel-skich-sieti/](https://sekarl.euba.sk/arl-eu/sk/detail-eu_un_cat-0213832-Inovacne-podnikanie-a-hodnotenie-inovacneho-potencialu-podnikatel-skich-sieti/)
30. Maqsood, A. S., Tareq Zayed, A. A., & Wikström, K. (2019). Benchmarking the strategic roles of the project management office (PMO) when developing business ecosystems. *Benchmarking*, 27(2), 452-469. <https://doi.org/10.1108/BIJ-03-2018-0058>
31. Moef, Al., Pellerin, R., Lamouri S., Tamayo-Giraldo, & Barbaray, R. (2017). The industrial management of SMEs in the era of Industry 4.0. *International Journal of Production Research*, 56(3), 1118-1136. doi.org/10.1080/00207543.2017.1372647
32. Petrů, N., Kramoliš, J., Stuchlík, P. (2020). Marketing Tools in the Era of Digitization and Their Use in Practice by Family and Other Businesses. *E&M Economics and Management*, 23(1), 197-212. Retrieved from <http://dspace.tul.cz/handle/15240/154710>
33. Písař, P., & Havlíček, K. (2018). *Advanced Controlling and Information Systems Methods as a Tool for Cohesion and Competitiveness of the European Union* (Proceedings of the 4th International Conference on European Integration 2018, Ostrava, 1172 p.). Retrieved from <https://is.vsfz.cz/repo/6837/>
34. Písař, P., & Tomášková, A. (2019). *The importance of social networks for the SME innovation potential in Industry 4.0* (Working paper). Retrieved from [https://www.researchgate.net/publication/343433380\\_The\\_importance\\_of\\_social\\_networks\\_for\\_the\\_SMEs\\_innovation\\_potential\\_in\\_Industry\\_40](https://www.researchgate.net/publication/343433380_The_importance_of_social_networks_for_the_SMEs_innovation_potential_in_Industry_40)
35. Porter, M. E. (2004). *Competitive strategy: techniques for analysing industries and competitors* (396 p.). New York: Free Press. Retrieved from <https://www.hbs.edu/faculty/Pages/item.aspx?num=195>
36. Rompho, N. (2018). Operational performance measures for startups. *Measuring Business Excellence*, 22(1), 31-41. <https://doi.org/10.1108/MBE-06-2017-0028>
37. Sachitra, V. (2016). Review of Competitive Advantage Measurements: Reference on Agribusiness Sector. *Journal of Scientific Research & Reports*, 12(6), 1-11. <https://doi.org/10.9734/JSR/2016/30850>
38. Safar, L., Sopko, J., Bednar, S., & Poklemba, R. (2018). Concept of SME business model for industry 4.0 environment. *TEM Journal*, 7(3), 626-637. <https://doi.org/10.18421/TEM73-20>
39. Shih-Chi, C., & Sharfman, M. (2018). Corporate social irresponsibility and executive succession: An empirical examination: JBE. *Journal of Business Ethics*, 149(3), 707-723. <http://dx.doi.org/10.1007/s10551-016-3089-7>
40. Stimie, J. E., & Vlok, P. J. (2016). A mechanism for the early detection and management of physical asset management strategy execution failure. *South African Journal of Industrial Engineering*, 27(3), 158-173. <http://dx.doi.org/10.7166/27-3-1651>
41. Strandhagen, J. W., Alfnes, E., & Vallandingham, L. R. (2017). The fit of Industry 4.0 applications in manufacturing logistics: a multiple case study. *Advances in Manufacturing*, 5, 344-358. <https://doi.org/10.1007/s40436-017-0200-y>
42. Tsintsadze, A., Oniani, L., & Ghoghoberidze, T. (2018). Determining and predicting correlation of macroeconomic indicators on credit risk caused by overdue credit. *Banks and Bank Systems*, 13(3), 114-119. [http://dx.doi.org/10.21511/bbs.13\(3\).2018.11](http://dx.doi.org/10.21511/bbs.13(3).2018.11)
43. Unger, B., Gemünden, H., & Aubry, M. (2012). The three roles of a project portfolio management office: their impact on portfolio management execution and success. *International Journal of Project Management*, 30(5), 608-620. <https://doi.org/10.1016/j.ijproman.2012.01.015>
44. Vitezić, N., & Vitezić, V. (2015). A Conceptual Model of Linkage between Innovation Management and Controlling in the Sustainable Environment. *The Journal of Applied Business Research*, 31(1), 175-184. <https://clutejournals.com/index.php/JABR/article/view/8999>
45. Wijayatunga, P. (2016). A geometric view on Pearson's correlation coefficient and a generalisation of it to non-linear dependencies. *Ratio Mathematica*, 30, 3-21. Retrieved from <https://arxiv.org/ct?url=https%3A%2F%2Fdx.doi.org%2F10.23755%2Frm.v30i1.5&v=ec75b392>
46. Zaušková, A., Bobovnický, A., & Madleňák, A. (2013). How can the state support the innovations to build sustainable competitive advantage of the country. *Serbian Journal of Management*, 8(2), 255-267. Retrieved from <https://www.ingentaconnect.com/content/doi/14524864/2013/00000008/00000002/art00009/supp-da-ta;jsessionid=b0d563me5r905.x-ic-live-01>
47. Zolkos, R. (2012). Strategic outlook key to successful risk management: Organisational goals must be considered at program's outset. *Business Insurance*, 46(17), 14-n/a.