# Application of BSC and EFQM models in small and medium-sized enterprises

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## ABSTRACT

**Research background:** The BSC and EFQM models are important tools to help SMEs to improve their performance through strategic initiatives in cooperation with operational activities, through the essential elements of these models.

**Purpose of the article:** The objective of the research presented in this paper is to analyse and compare the existence of Balanced Scorecard and EFQM models in small and medium-sized enterprises (SMEs), and to suggest possibilities of applying these models to a wider range of SMEs.

**Methods:** The process of evaluating research aim was based on a questionnaire survey. The number of respondents was 378. Both small and medium-sized enterprises participated in the survey, with the number of their employees being as follows: from 1 to 9 a total of 28.6% enterprises (28.6%), from 10 to 49 a total of 38.1% enterprises (38.1%) and from 50 to 249 a total of 33.3% enterprises. The methods of descriptive statistics and correlation and regression analysis were used to test the scientific hypotheses.

**Findings & Value added:** Since the research results point to a relatively high dependence, it can be concluded that implementing the models in the SME sector has its justification. In terms of their management practice, the authors of this paper have used the findings directly in their consulting and research activities, and have incorporated the models into strategic management systems of particular enterprises. Recommendations presented here are therefore based on the research as well as conclusions of the hypotheses tested regarding the above two models and their larger introduction to SMEs. The rate of use of the BSC model in SMEs has a statistically significant positive effect on the model performance measurement system.  Our results also confirmed that the rate of use of the EFQM models (H3B) in SMEs has not a statistically significant positive effect on the performance measurement system (PMS).

## INTRODUCTION

Small and medium-sized enterprises (SMEs) are an important part of the world's economies. These enterprises have specific characteristics that significantly affect their business activities in a comprehensive way. SMEs are extremely heterogeneous, mostly managed by owners whose management activities are based on informal practices (Vivier, 2013; Mayanja and Perks, 2017), and their management style reflects the values, character, attitudes, education and family background of the owner-entrepreneur (Sunil, 2017; Rostami et al., 2022). Considering these factors, it can be assumed that they use less sophisticated management methods in forecasting, analysis and planning (Savur et al., 2018).

SMEs around the world are constantly threatened on their survival (Kim, 2021). In their quest for economic survival in the face of increasing competition, many firms are making significant strategic changes in the management of their businesses. The key to success is the management of the core internal processes of the business aimed at improving critical factors of firm performance such as cost, quality and customer orientation (Bubenik et al., 2022). Wall (2021) states that corporate strategy, process, product and organizational innovations are important factors that improve the performance of SMEs. SME managers face challenges in decision making where resource scarcity, operational pressures and entrepreneurial spirit play an important role (Savur et al., 2018).

The BSC and EFQM models are important tools to help SMEs to improve their performance through strategic initiatives in cooperation with operational activities, through the essential elements of these models. The Balanced Scorecard (BSC) model is a strategic framework that measures and manages the performance of firms based on the evaluation of four perspectives: the financial perspective, the customer perspective, the process perspective, and the learning and growth perspective. The model helps firms link strategic management to these areas and develop key performance indicators to track the achievement of strategic objectives. It significantly assists the firm in managing its performance. The European Foundation for Quality Management model (EFQM model) is a tool for assessing the quality and performance of firms. The basic elements of the EFQM model are performance criteria, scoring, self-assessment and feedback and improvement.

From an analytical perspective, both models can be classified as multi-criteria performance evaluation models that can effectively influence the entire system of strategic management in enterprises.

This research focuses on the area of BSC models and EFQM models in the SME segment. The originality of the research lies in the fact that it presents the importance of the implementation of these models in SMEs, but at the same time explores the possibilities of their synergistic effect on each other.

## THEORETICAL BACKGROUND

At present, various models are used to evaluate company performance. Selected performance management concepts include Benchmarking, Strategic Planning, Change Management, Knowledge Management, CRM, BSC, Core Competencies, Scenario and Contingency Planning, and others, as e.g. Rigby & Bilodeau (2017) state in their research (see in Figure 1).

Such concepts are intended to ensure not only company performance evaluation, but also effective management. With the growing significance of intellectual capital, this capital is becoming an important tool for increasing company competitiveness, since competitive advantages reside primarily in intangible, especially intellectual, resources. However, there are very different notions of strategy underlying balanced scorecard and intellectual capital approach, causing such comprehensive perfor-

Figure 1: Bain Management Tools & Trends survey, 2017
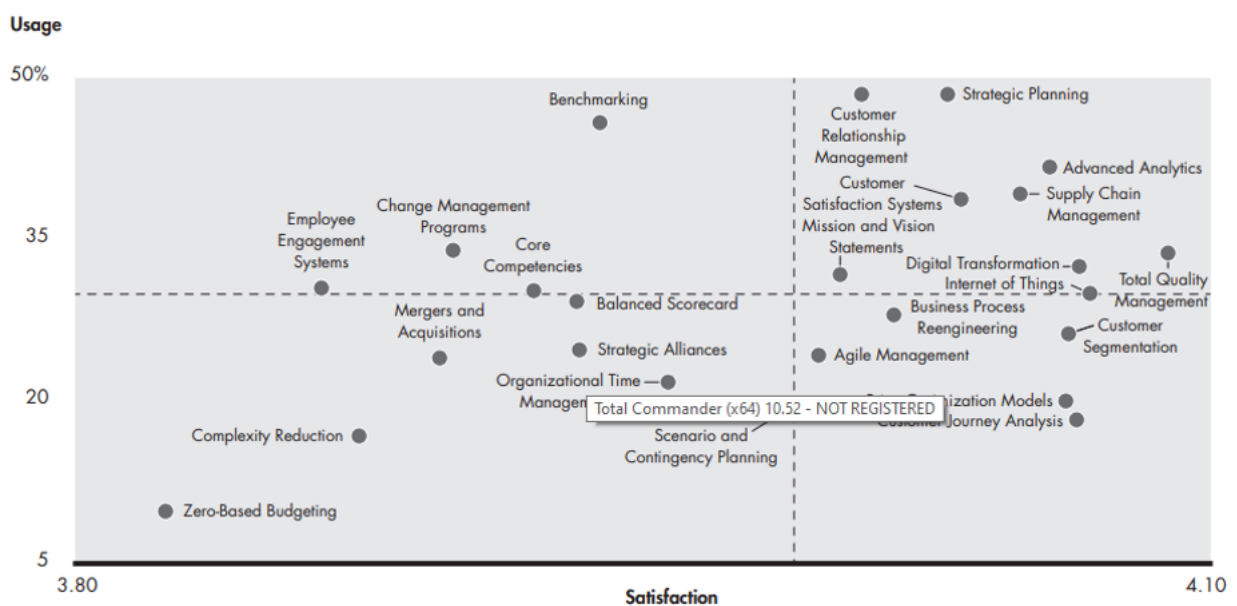
mance management systems to act in very different ways – the difference between tightly coupled and loosely coupled systems accounts for this (Ulum, 2010). Thus, even in small and medium business, both financial and non-financial resources must be involved in management systems given the development of innovation and modern digital technologies. Based on these resources, company objectives should be formulated with the use of well-defined KPIs. Additionally, financial goals and their associated metrics still form significant indicators that serve to measure business success, but their achievement depends on reaching non-financial KPIs related to customers, processes, employees and their intellectual capital.

Furthermore, the linking of financial and non-financial goals has been scientifically addressed by Norton and Kaplan who developed the Balanced Scorecard model allowing managers to make interrelationships between objectives from four defined perspectives, namely financial, customer, process, and learning and growth (Kaplan & Norton, 2000). When regarding these perspectives, the BSC creates interconnections between different stakeholders and interest groups. (Kaplan & Norton, 2006). This model was later followed by the X-Matrix model, developed by Hoshin Katri, where short-term goals and long-term goals were linked not only mutually, but also to resources. (Melander et al., 2016)

Unlike the BSC, the EFQM model explains relationships between activators and outcomes. It was introduced in the same year as the Balanced Scorecard model by the European Foundation for Quality Management in 1992 (Santos et al. 2007), was then renamed the European Excellence Model in 1998, and has since become one of the essential quality concepts for the 21st century. In fact, it competes with concepts based on ISO norms and standards (Nenadál, 2018). The model is characterized by the inclusion of self-assessment criteria and its using also promotes the intellectual capital that companies have. As well as the BSC, this model also incorporates parts of intellectual capital that can improve company strategic management systems. In his research, Yousaf (2022) points out that significant results of a dummy variable revealed that firms with quality certifications under the EFQM Excellence model perform better than non-certified firms. He therefore recommends firm leaders and managers that they participate and implement the model in the respective firms to increase their performance.

However, the difference between the two models is that while the Balanced Scorecard helps managers to identify and correctly set goals as well as the linkages between them, the EFQM model is used primarily to assess company success in achieving these goals. It also incorporates a controlling perspective and allows to monitor whether a particular company is on track to reaching the goals. If not, it will "turn on the red light" in time and point out deviations that have occurred (Horváth et al., 2020).

Also, when analysing the models in terms of complementarity, it is to find out whether these alternative ways of measuring performance provide a suitable tool for evaluating management success (Dahlgaard, 2008). If one is aware of the characteristics of these models and their interrelationships as well as interconnectedness of each KPI, a very effective model for strategic management in the SME sector can be developed. Based on their research and practical experience, the authors of this paper have implemented these two models directly in some firms in order to see their relevance for managing businesses in the 21st century.

## Strategic management and company performance measurement in terms of research purposes

On the grounds of the authors´ personal visits to different companies and their consulting activities for them, it can be stated that a large number of companies still use regular management methods based on indicators characterising mainly operational goals, and such companies even lack a longer-term focus. However, a closer link between objectives and employees can already be observed, particularly in the area of company performance management and employees. Still, theoretical rather than practical views prevail on the use of comprehensive models (or systems) of company performance management (Hogue & James 2000). Some authors such as Goldratt & Cox (2004) recommend using more than one model for performance management (Andjelkovic & Dahlgaard, 2013). In addition to that and based on the experience of the authors of this paper with implementing such systems in corporate practice, the authors are inclined to applying multiple models to performance measurement with the use of the synergistic effect. Thus, combining the BSC and EFQM models can be a very effective solution. Then, other authors such as Töpfer et. al. (2008) also to discuss combining the two models with the SixSigma model, which further increases the effectiveness of company performance management. The differences in implementing these models are seen in that a number of authors such as Töpfer (2008), Dror (2008), or Lua, Bettsa, & Croom (2011) recommend focusing on their synergistic effect. On the contrary, authors such as Shahin et al. (2012) attempt to interlink these models and integrate them with one another. These are also two approaches to address this issue.

Moreover, BSC and EFQM are management models that were developed for different purposes. While a strategic system of company management is preferred in terms of BSC, the EFQM model was developed within the concept of quality, similarly to the Six Sigma model. By combining these two models into one, not only an effective company management system is gained, but also efficiency in terms of management quality is increased. Apart from that, while the former is focused on precise goal setting in the direction of a certain vision (Kaplan & Norton, 2006), the latter is orientated towards the quality of this system as well as self-evaluation in achieving results of these efforts (Dahlgaard et al. 2013). In connection with their consulting activities, the authors of this

paper have encountered the synergy of the two models in MKEM, s.r.o. (Slovakia), a multinational company producing wiring harnesses for FIAT cars. The results of this combination were excellent and the system used in the company has even become a management tool for determining the direction of development and measuring the company's performance. It should also be noted that this company, as well as some other companies the authors have come across in their professional practice, have already built a controlling system, or are actively considering the use of the two management models when building such system.

Correspondingly, The European Foundation for Quality Management (2012) states that "... although a range of management tools and techniques are used, the EFQM Excellence model provides a holistic view of organisations ...". Considering this statement and the authors´ 20+ years of experience, it can be argued that these models can be linked to any number of management tools and controlling systems and adapted to the needs and functions of a given organisation.

In order to provide an additional theoretical insight into the previously mentioned concept, the effectiveness of the authors´ assumptions was examined with regard to selected trading companies on the basis of empirical data obtained through a survey related to the metrics used in the aforementioned models. Specifically, one of the assumptions was that a BSC system using controlling tools can be effectively combined with a quality management system based on the Excellence model standard. A particular framework for linking these two systems and the controlling system is provided in Table 1 below.

Table 1: Relationship framework between BSC and EFQM

| BSC | Controlling | EFQM |
|---|---|---|
| Financial perspective | Sales controlling Financial controlling | Business results Company results |
| Customer perspective | Marketing controlling | Customer results |
| Process perspective | Process controlling Product controlling | Processes Products Partnerships |
| Learning and growth | Personnel controlling Strategic controlling HR Scorecard | People Strategies, KPI Leadership |

Source: Own processing

As regards Table 1, it shows the synergy between the models and controlling as a management tool that supports the effective use of these models, particularly in terms of sources of information, thus creating a digital

support for this process. A similar point is made by Davis & Albright (2004), but they do not specify their data sources and how this linkage works. In addition to the above table, a segmented approach is assumed in terms of the four BSC perspectives as well as establishment of causal relationships between these perspectives and the EFQM model (Davis & Albright, 2004) with a link to the controlling system. Besides, it follows that practical functioning of these models in SMEs without controlling would probably not achieve the desired effect.

Also, the overall success in achieving the goals with the use of the BSC is confronted with results of the EFQM model and a description of the success in planning its criteria according to individual areas with the support of controlling. It can be seen from Table 1 how the activities are reflected in the EFQM model and how they are related to the sources from where they can be monitored. The financial perspective of the model is reflected in business results and company results. The sources of data on which facts are subsequently evaluated are presented in financial controlling and sales controlling (Strakova, 2022). The customer perspective is reflected in customer results, while the sources of information and knowledge are found in marketing controlling. The process perspective is linked to the EFQM model through processes, products and partnerships, and the sources of information are in process and product controlling. Learning and growth as the BSC perspective that also reflects a learning organization is seen in the people, strategies, KPI and leadership factor. It is linked to the source of information from the personnel and strategic controlling and HR scorecard, which is actually a continuation of the BSC in the learning organization and is closely related to the people and leadership factor.

When applying this framework, it is possible to effectively monitor an organisation's performance using the BSC with a link to the Quality Excellence concept represented by the EFQM model. The corresponding results can be presented in the form of dashboards and hence substantially improve the linkage of scientific knowledge to practice and effective company management. The resulting model supported by controlling can be used in dashboards as an integrated model of success or failure of the organisation.

The authors of this paper focused their research on SMEs, where this system is not yet as sophisticated as in large enterprises, with the number of enterprises in this segment being many times higher. Based on their consulting activities, the authors claim that it is also less adept at strategic management and performance management. When considering the industrial production segment and with online reference to www.indexpodnika-tela.sk, there are 16 138 companies in Slovakia also listing the number of employees in their profile. Of these, there are 15 409 companies with less than 100 employees and 15 842 companies with up to 250 employees, which accounts for 95.5% of companies with less than 100 employees and 98.2% of companies with up to 250 employees. Overall, a total of 378 enterprises

which expressed interest in participating in the research were approached and asked to fill in a questionnaire which was completed by executives of these enterprises using the BSC model. The results were then compared with enterprises that did not use this model, with the response rate for these two groups being 56% in favour of using the BSC. Given that the EFQM model is used only to a small extent in these enterprises, parameters that fit both models were selected and their dependence was examined. It was then tested on the basis of probabilistic hypotheses previously established. Some enterprises were familiar with the model, and there was even one that used both of the above models. According to an analysis of its results, it was found that the enterprise had already used these models in the time of the 2008-9 crisis, and it was the use of these models that helped the enterprise to overcome economic problems associated with this crisis in the course of a few months (MKEM, 2011).

Analysing of the relationships presented in Table 1 is related to an evaluation of the parameters and variables arising from the two aforementioned models. The evaluation was made on the basis of a questionnaire (see Appendix) containing closed questions in the form of describing individual parameters of the perspectives in comparison with the EFQM model. The approached executives used Likert scale from 1 to 5 to answer questions in the following manner: 1 - Completely disagree, 2 - Partially disagree, 3 - Neither agree nor disagree, 4 - Partially agree, 5 - Completely agree. Evaluating the questionnaire statements was seen as the perception of the respondents regarding a level of presence, or state of each parameter of the variable in their respective enterprise. The authors focused on selected parameters stated in the questionnaire which were present in the sample under study, and assumed that most enterprises are currently shifting towards learning organizations and thus the evaluation system was adapted accordingly. The questionnaire covers the BSC perspectives and includes questions on each of the perspectives under consideration: performance, learning to grow, customers and processes. The second part of the questionnaire was related to the EFQM model and contained questions from the EFQM criteria analysed, namely: strategy, people, KPI, partnerships and sources, processes, products and services, and customer satisfaction. The findings are presented in the Results section and are applied to the process of implementation into company management. At present, these findings are being implemented directly in 5 companies in the industrial manufacturing sector involving the SME segment.

Data analysis was conducted on the grounds of inductive reasoning as well as deductive reasoning with the use of comparative analysis. In terms of quantitative analysis, mainly statistical tools and methods were used – descriptive statistics, Anova, correlation, regression analysis. In order to ensure comparability of results and conclusions, the same methods were used across all research questions and studies.

## AIM, METHODOLOGY AND DATA

The aim of the research was to analyse and compare the existence of the Balanced Scorecard model and the EFQM model in SMEs, and to suggest possibilities of introducing these models to a wider range of SMEs.

The process of evaluating research aim was based on a questionnaire survey. The number of respondents was 378. The questionnaire contained a total of 17 questions, where the first five questions dealt with the identification of enterprises and the other questions were directly related to the issue under study. The questions were structured as close-ended, semi-open as well as open-ended to capture the respondents' opinions on the issue as thoroughly as possible. Both small and medium-sized enterprises participated in the survey, with the number of their employees being as follows: from 1 to 9 a total of 105 enterprises (28.6%), from 10 to 49 a total of 144 enterprises (38.1%) and from 50 to 249 a total of 126 enterprises (33.3%). Regarding individual positions in the enterprises, the survey comprised managers (58.0%), quality managers (19.4%), TOP managers (15.1%) and owners (7.5%). The respondents were selected by random sampling method. Empirical research was conducted in 2021-2022.

In relation to that, the following research questions were formulated:

- What is the main problem caused by non-implementation of the BSC and EFQM models in SMEs?

- Are there differences in perceiving the BSC and EFQM models between enterprises that have a strategic management system and those that do not have it?

- Is there a link between introduction and non-introduction of the BSC and EFQM models in enterprises?

Following on from the above context and to examine dependence of the two models, three hypotheses were established:

- H1: There is a statistically significant relationship the rate of use of the BSC model in SMEs on the model performance measurement system (PMS).

- H2: There is a statistically significant relationship the rate of use of the EFQM model in SMEs on the model performance measurement system (PMS).

- H3: There is a statistically significant relationship the rate of use of the BSC (H3A) and EFQM models (H3B) in SMEs on the performance measurement system (PMS).

The methods of descriptive statistics and correlation analysis (CA) and linear regression modelling (LRM) were used to test the scientific hypotheses. These statistical methods are good methods for evaluating H1, H2, and H3 because according to these methods is possible evaluation of connection and relationships between variables.

## RESULTS AND DISCUSSION

The results of the research are presented in the following tables.

The corresponding frequencies of performance indicators are shown in Table 2.

The respondents had an option to give multiple answers to each question. As can be seen from Table 2 above, the following indicators received the highest scores: Employee satisfaction (19.5%), Market share (13.0%), Cash flow (12.2%), Employee performance evaluation (10.6%), Total liquidity (8.9%), ROA (8.1%). Other surveyed indicators achieved less than 8%.

In this context, Dar and Mishra (2021) emphasize that the entrepreneurial activities of SMEs are critically influenced by human capital because skilled and motivated employees lead firms to success. Employee attitude and behaviour are related to the survival of the firm and its with the realisation of business objectives. Employees are the foundation of a company and are its guarantee for sustainable development (Xie et al., 2022). A system

of caring HRM practices will result in an organizational climate of care and concern for employees, to which employees will respond with care for the company and higher levels of commitment (Saks, 2022). Employee turnover is a key issue that can threaten a company's survival, either by reducing its revenue or increasing its costs (Castro-González et al., 2021).

Table 3 shows the state of implementing performance management system in the enterprises concerned. Table 3 presents that 22.11% of the enterprises are using a performance measurement system, 8.42% of them are implementing it and 22.11% are planning to implement it. In terms of using management tools, the results are as follows: Strategic Planning (21%), CRM (18%), Internal Innovation Support (13%), BSC (10%), Vision Setting (10%), Benchmarking (9%), Knowledge Management (8%), EFQM (4%), TQM (4%), Outsourcing (3%).

The research has confirmed that the use of performance management systems by SMEs is not at an adequate level. SMEs adopt inadequate and ineffective practices to manage enterprise risk (Chakabva et al., 2021). Or-

Table 2: Performance indicators used to measure long-term goal

| Perspective | Indicator | Frequency | Sum of Values |
|---|---|---|---|
| Financial perspective | Return on assets ROA | 90 | 8.1% |
| | Return on equity ROE | 81 | 7.3% |
| | Cash flow | 135 | 12.2% |
| | Total liquidity | 99 | 8.9% |
| | Earnings before interest, taxes, depreciation and amortization EBITDA | 36 | 3.3% |
| Customer perspective | Customer loyalty | 72 | 6.5% |
| | Market share | 144 | 13.0% |
| Process perspective | Product innovation | 54 | 4.9% |
| | Process optimization | 63 | 5.7% |
| Learning and growth | Employee satisfaction | 216 | 19.5% |
| | Employee performance evaluation | 117 | 10.6% |
| **Total** | | **1107** | **100.0%** |

Source: own processing

Table 3: Company performance measurement system

| Performance measurement system | Frequency | % |
|---|---|---|
| 1 – Performance measurement system is set up and used in enterprise management | 189 | 22.11% |
| 2 – Performance measurement system is currently being implemented | 36 | 8.42% |
| 3 – Performance measurement system is due to be implemented | 63 | 22.11% |
| 4 – Performance measurement system is set up but not used in management | 45 | 21.05% |
| 5 – Performance measurement system is not used in enterprise management | 45 | 26.32% |
| **Total** | **378** | **100.00%** |

Source: own processing

Table 4: Hypothesis 1 (H1) testing related to relationships of using BSC in management and performance measurement system (PMS)

| Regression Statistics | Value | Description |
|---|---|---|
| Multiple R | 0.75936 | The correlation coefficient is 0.75, which indicates stronger dependence between the variables. |
| R Square | 0.57663 | The coefficient of determination: variability of the variable is 57.6%. The rest includes unexplained variability, the effect of random factors and other unspecified influences. |
| Observations | 378 | Number of measurements (enterprises, etc.) |

| ANOVA | | | | | | |
|---|---|---|---|---|---|---|
| | df | SS | MS | F | Significance F | F - rating F test |
| Regression | 1 | 483.379 | 483.379 | 512.1078 | 3.60197E-72 | Significance F = 0,000.....3,601E-72 < 0,05 (a – significance level). |
| 0,05 (a – significance level). H0 refuted, which means the model was chosen correctly (significantly). | | | | | | |
| Residual | 376 | 354.9067 | 0.943901 | | HA was accepted, which means the model was chosen correctly. | |
| Total | 377 | 838.2857 | | | If H0 is <0,05, then it is chosen correctly and H0 is refuted. | |

| Parameter | Coefficients | Standard Error | t Stat | P-value | Lower 95% | Upper 95% | Lower 95.0% | Upper 95.0% |
|---|---|---|---|---|---|---|---|---|
| Intercept | 1.110964 | 0.09193 | 12.08485 | 1.24E-28 | 0.930202 | 1.291726 | 0.930202 | 1.291726 |
| BSC model | 0.771995 | 0.034114 | 22.6298 | 3.6E-72 | 0.704916 | 0.839073 | 0.704916 | 0.839073 |

Source: own processing

ganizational culture and strategic risk management are full-fledged and positive mediators between enterprise risk management and financial performance of SMEs (Syrova and Spicka, 2023). Business model innovation contributes significantly to financial and non-financial performance (Al-Nimer et al., 2021). The success of firms' business activities also depends on effective risk management (Belas et al., 2023).

The results of correlation and regression analysis determined the impact of using the BSC model on SMEs performance. These results are presented in Table 4.

If the measurement system were zero, the Intercept BSC would be 1.11. The X variable BSC indicates that if the BSC is increased by one unit of measurement, the performance rate of use will increase by 0.772. The regression function is y = 1.111 + 0.772x. Null hypotheses tested in this analysis relate to significance of the locating constant and the regression coefficient, with the null hypothesis asserting insignificance of the respective coefficient and the alternative hypothesis asserting its significance. In order to evaluate these claims, P-values are used. Specifically, the locating constant P-value is 1.24E-28 < 0.05, which suggests that the locating constant is statistically significant. The regression coefficient

P-value is 3.60E-72 < 0.05, which also confirms the significance of this coefficient. In addition to the aforementioned information, this part of the output table also provides 95% confidence intervals for b0 and b1. If the efficiency of using the BSC increases by one percent, then the BSC will increase from 0.709 to 0.839 with 95% probability.

**H1 was supported.**

Moreover, the second correlation analysis examined an impact of the rate of use of the EFQM model on enterprise performance. It can be seen in Table 5 below that the relationship of these variables is also linearly correlated in a positive manner. This implies that the greater the use of the EFQM model occurs in a particular enterprise, the higher its performance is, as revealed by the correlation coefficient value (Table 5). Thus, in order to investigate the second hypothesis (H2), dependence of management with the use of the EFQM and performance measurement system was determined. The significance test of the correlation coefficient also confirmed that the results of this correlation analysis are statistically significant and the dependence of the variables is stronger. Based on this, the hypothesis dealing with the positive correlation relationship of the variables under study was confirmed.

Table 5: Hypothesis 2 (H2) testing related to relationship of using EFQM in management and performance measurement system (PMS)

| Regression Statistics | Value | Description |
|---|---|---|
| Multiple R | 0.5826252 | The correlation coefficient is 0.58, which indicates stronger dependence between the variables. |
| R Square | 0.3394528 | The coefficient of determination: variability of the variable is 33.9 %. The rest includes unexplained variability, the effect of random factors and other unspecified influences. |
| Observations | 378 | Number of measurements (enterprises, etc.) |

| ANOVA | | | | | | |
|---|---|---|---|---|---|---|
| | df | SS | MS | F | Significance F | F - rating F test |
| Regression | 1 | 203.0894 | 203.0894 | 193.2245 | 9.73771E-36 | Significance F < 0,05 (a - significance level). H0 refuted, which means the model was chosen correctly. |
| Residual | 376 | 395.1963 | 1.051054 | | | HA was accepted, which means the model was chosen correctly. |
| Total | 377 | 598.2857 | | | | If H0 is <0,05, then it is chosen correctly and H0 is refuted. |

| Parameter | Coefficients | Standard Error | t Stat | P-value | Lower 95% | Upper 95% | Lower 95.0% | Upper 95.0% |
|---|---|---|---|---|---|---|---|---|
| Intercept | 1.677675 | 0.09700 | 17.2941 | 1.01146E-49 | 1.486928 | 1.8684215 | 1.48692 | 1.868422 |
| BSC model | 0.500396 | 0.03600 | 13.9005 | 9.73771E-36 | 0.4296129 | 0.5711796 | 0.42961 | 0.57118 |

Source: own processing

If the measurement system were zero, the Intercept EFQM would be 1.68. The X variable EFQM indicates that if the EFQM is increased by one unit of measurement, the performance rate of use will increase by 0.500. The regression function is y = 1.678 + 0.5x. Null hypotheses tested in this analysis relate to significance of the locating constant and the regression coefficient, with the null hypothesis asserting insignificance of the respective coefficient and the alternative hypothesis asserting its significance. In order to evaluate these claims, P-values are used. The locating constant P-value is 1.011E-49 < 0.05, which suggests that the locating constant is statistically significant, whereas the regression coefficient P-value is 9.737E-36 < 0.05, which also confirms the significance of this coefficient. In addition to the aforementioned information, this part of the output table also provides 95% confidence intervals for b0 and b1. If the efficiency of using the EFQM increases by one percent, then the EFQM will increase from 0.429 to 0.571 with 95% probability.

The LRM results can be represented graphically for H2 by the function y = 1.111 + 0.772x, where x and y are the variables of the BSC model and enterprise performance, and for H2 by the function y = 1.678 + 0.5x, where x and y are the variables of the EFQM model and enterprise performance.

**H2 was supported.**

Then, in relation to multiple correlation analysis of enterprises using the BSC and enterprises using the EFQM depending on the performance measurement system variable, the following results were reached. Results are showed in Table 6.

If the BSC system was not used (zero value), the Intercept (performance measurement) would be 0.75. The X1 variable (BSC) indicates that if the BSC is increased by one unit of measurement, the efficiency of performance measurement will increase by 0.75 and yet the EFQM will remain unchanged. The X variable BSC indicates that if the BSC increases by one unit of measurement, the performance measurement according to the BSC will remain unchanged, whilst the EFQM efficiency will decrease by -0.013. The regression function is y = 0.141 + 0.7558x - 0.014 x2. Null hypotheses tested in this analysis relate to significance of the locating constant and the regression coefficient, with the null hypothesis asserting insignificance of the respective coefficient and the alternative hypothesis asserting its significance. In order to evaluate these claims, P-values are used. The locating

Table 6: Hypothesis 3 (H3) testing related to relationship of using EFQM in management and performance measurement system (PMS)

| Regression Statistics | Value | Description |
|---|---|---|
| Multiple R | 0.759396 | The correlation coefficient is 0.75, which indicates stronger dependence of the relationship. |
| R Square | 0.576682 | The coefficient of determination: variability of the variable is 57.67%. The rest includes unexplained variability, the effect of random factors and other unspecified influences. |
| Observations | 378 | Number of measurements (enterprises, etc.) |

| ANOVA | | | | | | |
|---|---|---|---|---|---|---|
| | df | SS | MS | F | Significance F | F – rating F test |
| Regression | 2 | 467.7303 507 | 233.8652 | 255.4295 | 9.99999E-71 | Significance F < 0,05 (a – significance level). H0 refuted, which means the model was chosen correctly. |
| Residual | 375 | 343.3410 779 | 0.915576 | | | HA was accepted, which means the model was chosen correctly. |
| Total | 377 | 811.071428 6 | | | | If H0 is <0,05, then it is chosen correctly and H0 is refuted. |

| Parameter | Coefficients | Standard Error | t Stat | P-value | Lower 95% | Upper 95% | Lower 95.0% | Upper 95.0% |
|---|---|---|---|---|---|---|---|---|
| Intercept | 0.14055 | 0.121336 | 1.1583 | 0.24742 | -0.098036323 | 0.3791356 | -0.09804 | 0.379136 |
| BSC model | 0.755761 | 0.052133 | 14,496 | 4.01E-38 | 0.653249829 | 0.858271 | 0.65325 | 0.858271 |
| EFQM in management | -0.01351 | 0.061710 | -0.2189 | 0.8268 | -0.134853398 | 0.107830 | -0.1348 | 0.10783 |

Source: own processing

constant P-value is 0.247 > 0.05, which suggests that the locating constant is statistically insignificant. The regression coefficient P-value is 0.82 > 0.05, which also confirms the insignificance of this coefficient. In addition to the aforementioned information, this part of the output table also provides 95% confidence intervals for b0 and b1. If the efficiency of using the EFQM increases by 1%, then the performance measurement will increase from 0.653 to 0.858 with 95% probability.

**H3A was supported and H3B was rejected.**

A suitable form to evaluate the use of advanced performance evaluation methods by SMEs is self-assessment through a questionnaire, displayed in table 7. The questionnaire can be used in its entirety by enterprises or adapted at the discretion of enterprises in the SME sector. Once completed, the self-assessment questionnaire provides information on how each criterion is perceived. Here the evaluator expresses his/her opinion (either agree or disagree) by assigning a number 1 to his/her answer according to the legend at the top of the questionnaire. Each question contains 4 answers, which are then multiplied by the appropriate percentage. The total score

Table 7: Self-assessment questionaire criterions

| TOTAL | Points 1 000 | % 112 % |
|---|---|---|
| Criterion 1: Leadership | 100 | 10 % |
| Criterion 2: People | 90 | 9 % |
| Criterion 3: Policy and strategy | 80 | 9 % |
| Criterion 4: Partnership and resources | 90 | 9 % |
| Criterion 5: Processes | 140 | 14 % |
| Criterion 6: Employee performance | 90 | 9 % |
| Criterion 7: Customer results | 200 | 20 % |
| Criterion 8: Company results | 60 | 6 % |
| Criterion 9: Key performance results | 150 | 25 % |

Source: own processing

for a given company is determined by the sum of the individual scores. A practical application of this model is shown in Figure 2. Also, the models discussed will help SMEs to become competitive, efficient and most importantly process and performance oriented.

Table 8: Self-assessment questionaire outline [add number 1 to the correct answer]

| EFQM Model | | A | B | C | D | Calculation | | | | % of fulfilment |
|---|---|---|---|---|---|---|---|---|---|---|
| **Criterion 1: Leadership** | | Score | | | | 100 | Total | | | 10 % |
| a | Company executives develop the company's mission, vision and values and conduct themselves in accordance with their fulfilling. | 1 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 100 % |
| b | Company executives use unwritten principles when managing the company and employees. | 1 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 100 % |
| c | .................. [other questions / statements] | | | | | | | | | |

Source: own processing

Figure 2: EFQM model for SMEs (Sample)
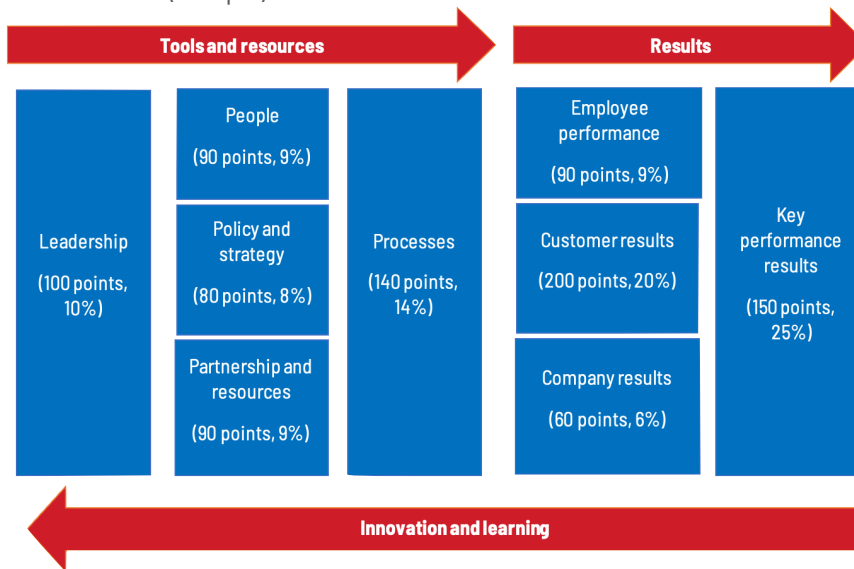


Source: own processing

## CONCLUSION

The objective of the research presented in this paper is to analyse and compare the existence of Balanced Scorecard and EFQM models in small and medium-sized enterprises (SMEs), and to suggest possibilities of applying these models to a wider range of SMEs.

The rate of use of the BSC model in SMEs has a statistically significant positive effect on the model performance measurement system. Our results also confirmed that the rate of use of the EFQM models (H3B) in SMEs has not a statistically significant positive effect on the performance measurement system (PMS).

A well-implemented Balanced Scorecard system will enable enterprises to improve not only their financial indicators, but also indicators involving customers, processes and employees. The ultimate goal in the BSC model is to maximize enterprise value, and achieving this will satisfy internal and external stakeholders. Linking the BSC model with the EFQM model will enable enterprises (through a self-assessment process) to identify their strengths as well as weaknesses that are to be improved.

The EFQM model does not provide enterprises with direct recommendations in the form of investments, and thus the authors recommend linking the EFQM Excellence model to the Balanced Scorecard model. Both models have a valid relevance in the context of business process strategy as they provide enterprises with an insight into their future growth. By applying both models, enterprises can discover gaps and gain knowledge on which processes are to be innovated, made better or eliminated. At present, however, a large number of enterprises are not familiar with these methods. It is advisable to integrate the models in such a manner that one model is complementary to the other (e.g. EFQM criteria are complemented with necessary strategies).

As previously mentioned, self-assessment generally helps companies to clearly recognize their strengths as well as areas for improvement. Its primary purpose is to accelerate improvement and increase the potential for improvement. In terms of a self-assessment process, a particular company selects and trains a number of employees to be assessors who rate the company's performance according to certain criteria and produce an annual assessment report. Based on that, a business action plan is drawn up containing priorities and ways of addressing them. With regular annual assessments, such model allows companies to compare their achievements with those of their competitors. Also, self-assess-

ments can highlight current sub-areas of process deficiencies which, if overlooked and not eliminated, may cause company visions to be unachieved.

The limitations of this research are in its regional limitation to the territory of the Czech Republic only. The presented scientific results can enrich the discussion in this area, which is important due to the fact that SMEs do not use sophisticated management tools that would enable them to sustainably grow their performance and thus to be stable and survive in the market.

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