Factors of Successful Implementation of the Balanced Scorecard Model in Public Enterprises

Benina Veledar[*]
Amra Gadžo[**]
Merjema Hadžialić[***]

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This research explores the opportunities and challenges of implementing the Balanced Scorecard (BSC) model in public enterprises in the Federation of Bosnia and Herzegovina (FBiH), with particular attention to adapting the

[*] Benina Veledar, PhD, Associate Professor, Department of Accounting and Auditing, Faculty of Economics, University of Sarajevo, Bosnia and Herzegovina (izvanredna profesorica, dr.sc., Katedra za računovodstvo i reviziju, Ekonomski fakultet, Sveučilište u Sarajevu, Bosna i Hercegovina), email: benina.veledar@efsa.unsa.ba.

ORCID:https://orcid.org/0000-0002-7636-5685

[**] Amra Gadžo, PhD, Associate Professor, Department of Accounting, Faculty of Economics, University of Tuzla, Bosnia and Herzegovina (izvanredna profesorica, dr.sc., Katedra za računovodstvo, Ekonomski fakultet, Sveučilište u Tuzli, Bosna i Hercegovina), email: amra.gadzo@untz.ba.

ORCID: https://orcid.org/0000-0002-5046-4925

[***] Merjema Hadžialić, Faculty of Ecomonics, Univeristy of Sarajevo, Bosnia and Herzegovina (Ekonomski fakultet, Sveučilište u Sarajevu, Bosna i Hercegovina), email: merjema_hadzialic@outlook.com.

ORCID: https://orcid.org/0009-0005-5303-1796

model to public sector characteristics. The study examines the impact of organisational, human, and economic factors on BSC implementation. Based on a quantitative analysis of 138 responses from employees in finance, accounting, and strategic management, seven hypotheses were tested regarding the determinants of BSC implementation. The findings reveal that the size of the enterprise, capabilities of accountants, costs of using the BSC, and its linkage to operational performance significantly and positively influence adoption. Larger enterprises with stronger capacities and qualified personnel are more likely to implement advanced performance management models. Conversely, organisational culture, management awareness, and perceived benefits showed no significant effect, partly due to the homogeneity of responses. These findings enhance the understanding of the prerequisites for BSC adoption in the public sector, highlighting the importance of structural capacities, human resources, and financial justification.

Keywords: Balanced Scorecard, public enterprises, implementation, operational performance, management

1. Introduction

Public enterprises, as integral components of the broader public sector, play a vital role in delivering services of general social interest. In Bosnia and Herzegovina, they employ a significant portion of the workforce, yet contribute only modestly to the overall value added in the economy, indicating the presence of structural inefficiencies in productivity and operational performance (Čegar & Parodi, 2019). As entities owned by the state or local government, these enterprises frequently operate under monopolistic conditions, which further underscores the importance of effective performance management and accountability to citizens.

Given the multifaceted roles of public enterprises, ranging from the provision of public services to the fulfilment of social and developmental objectives, traditional performance measurement models, which predominantly rely on financial indicators, do not provide sufficient insight for a comprehensive evaluation of their performance. As a result, integrated performance management models are increasingly being considered, among which the Balanced Scorecard (BSC), originally developed

by Kaplan and Norton (1992; 1996) as a strategic management tool to translate an organisation's vision and strategy into a coherent set of performance measures, has emerged as particularly relevant. The approach emphasises the balance between financial and non-financial measures, ensuring that short-term financial results are aligned with long-term strategic goals. The BSC enables performance monitoring across four key perspectives–customer, internal processes, learning and growth, and financialthereby moving beyond a purely financial focus and facilitating a broader understanding of the organisation's contribution to society as a whole. Despite the proven potential of the BSC in the private sector, its implementation within public enterprises faces numerous challenges, including institutional resistance, lack of training, limited resources, and the need to adapt the standard model to the public-interest context. Additionally, limited research on the application of this model within the public sector, especially in the context of Bosnia and Herzegovina, further hinders its wider and systematic adoption. Nevertheless, the specific nature of public enterprises and their multilayered social role provide scope for innovative approaches to performance measurement that also incorporate social, environmental, developmental, and other dimensions.

This paper aims to explore the opportunities and challenges associated with the implementation of the BSC model in public enterprises, with particular attention to adapting the model to the unique characteristics of the public sector. By analysing theoretical foundations and the primary data collected, the research investigates the factors contributing to successful implementation, identifies key obstacles, and proposes guidelines for developing a BSC framework suitable for the complex demands of public organisations. The paper is structured into three sections. The first section presents a review of existing research on the topic, considering selected constructs of the research model and hypotheses, which are detailed in the second section. The third section outlines the results of the quantitative analysis and provides a discussion of the findings.

2. Literature Review

Research on the implementation of the BSC in public sector organisations highlights several key factors that influence its successful adoption. Organisational size, the capabilities of accounting professionals, the costs of implementing the BSC, and its linkage to operational performance all positively impact adoption, particularly in larger enterprises with more

developed capacities and skilled personnel (Čizmić & Crnkić, 2017). The BSC is regarded as a suitable performance management tool for the public sector, especially in transitional economies where the ability to measure effectiveness is of critical importance (Dobrović & Tomičić, 2007). The model's four perspectives are adapted to the characteristics of public sector institutions, focusing on user satisfaction, financial efficiency, internal processes related to operational effectiveness, and continuous learning and growth (Vitezić, 2004). Nevertheless, the implementation process is often met with challenges, with managerial engagement and support at various organisational levels identified as critical success factors (Galas & Forte, 2005). Despite the continued popularity of the BSC concept, empirical evidence on the value of its implementation remains mixed, and the overall impact of BSC adoption on organisational success is still ambiguous. For example, a 2005 study by the Institute of Management Accountants found that 88% of BSC users believed that the model had improved their operational performance. In contrast, a study conducted during the same period by the business consultancy firm KPMG estimated a 70% failure rate for BSC implementation projects (DeBusk & Crabtree, 2006).

According to the contingency theory, as developed by Burns and Stalker (1961), organisational size is closely associated with decentralisation activities; as enterprises grow, the capacity of upper management to process information becomes increasingly limited. Moreover, the need to establish effective communication mechanisms is particularly prevalent in large organisations. One of the most effective solutions in such cases is the adoption of a sophisticated management model, such as the BSC. Ahmad and Zabri (2016) also demonstrated that organisational size has a positive influence on BSC implementation. Large enterprises generally possess greater economic potential and more complex management structures, and therefore require tools to enhance their managerial activities. Implementing the BSC can significantly support management in evaluating the efficiency of their operations.

Research indicates that organisational culture plays a significant role in the adoption and effectiveness of the BSC. A process-oriented culture influences BSC performance across all perspectives, while employee-oriented and pragmatic-oriented cultures impact specific dimensions (Putri, 2012). Organisations that have adopted the BSC tend to exhibit a market-oriented culture, placing emphasis on productivity, whereas those without the BSC often display an adhocracy culture (Oliveira et al., 2023). Employee involvement has been identified as the most influential cultural trait affecting BSC effectiveness in hospitals, suggesting that leadership

should foster staff participation in organisational processes (Farzaneh, 2012). Furthermore, team orientation, innovation, and a clearly defined mission demonstrate significant positive relationships with BSC implementation in industrial companies (Rababah & Bataineh, 2016).

Tanyi (2011) asserts that managers who understand the advantages of using the BSC over traditional financial and accounting indicators are more likely to adopt it, as it facilitates more efficient performance measurement and management. Northcott and Taulapapa (2012) investigated the application of the BSC in public sector organisations in New Zealand. Their study revealed that 91.67% of managers recognised the benefits of BSC usage, yet only eight institutions had implemented BSC tools. The authors further concluded that the BSC is more suitable for organisations with a strategic orientation and market competition. In contrast, public institutions, which typically do not operate in competitive markets and whose long-term strategies are often defined by legislation and regulation rather than managerial discretion, gain limited benefit from BSC implementation.

According to Kamerić (2022), the BSC serves as a flexible tool for articulating a company's vision, mission, and strategic planning process, allowing for adaptation to dynamic business environments. When properly implemented, the BSC can improve organisational management and lead to more successful operations. However, research highlights varying levels of BSC awareness and adoption among managers across different companies. Some organisations apply similar performance indicators without formally adopting the BSC framework (Tomić, Komazec & Jevtić, 2017).

Hung (2016) emphasises that accountants are key human resources in the implementation of management accounting tools, including the BSC. If their professional competencies are inadequate, BSC implementation either becomes unfeasible or lacks effectiveness. Similarly, Nhi and Toan (2018) state that staff with appropriate qualifications and knowledge of management accounting, including the BSC, enhance the likelihood of its adoption. Their findings also confirm that accountants' capabilities positively affect the implementation of the BSC within organisations.

Nonetheless, the BSC is often perceived as an expensive management tool, posing a challenge for enterprises wishing to adopt it (Benkova et al., 2020). Financial constraints are a common obstacle for organisations considering BSC implementation. Koske and Muturi (2015) also highlight that the cost of implementation is a critical factor in the decision-making process regarding BSC adoption.

Islam et al. (2014) investigated the influence of four behavioural factors on the adoption of the BSC, including the perceived benefits of its use. Ac-

cording to the authors, awareness of the advantages of using the BSC is the key factor influencing all other behavioural variables, including the perception of its benefits. Employees who are aware of the advantages are more inclined to use the tool, which directly affects the organisation's readiness to implement it. Similarly, Koske and Muturi (2015) examined the perceived benefits of the BSC in non-governmental organisations. They concluded that the BSC is useful for internal communication and decision-making, enhances organisational competitiveness, and supports service delivery through the customer perspective. Consequently, the authors recommend that managers consider BSC implementation in their organisations.

Hoque and James (2020) developed twenty measurement scales for evaluating the effectiveness of BSC usage, based on the four standard perspectives: financial, customer, internal processes, and learning and growth. Their research demonstrated a significant positive impact of BSC application on operational efficiency. Koske and Muturi (2015) similarly found that when an organisation is sufficiently informed and recognises the value of BSC implementation, improvements are observed across all four performance dimensions. Therefore, assessing the effectiveness of BSC implementation necessitates a focus on these four aspects of operational performance.

Organisations that have implemented the BSC model report several barriers, including employee resistance to change, lack of managerial commitment, fear of performance measurement outcomes, poor vertical communication within the organisation, prolonged implementation periods, subjective performance evaluations, and undefined performance appraisal and reward systems (Abdalla et al., 2022; Xuan, 2012).

The BSC model offers public enterprises a powerful tool for strategic management and performance measurement, enabling a holistic approach and alignment with the organisation's key objectives. However, successful implementation depends on the organisation's ability to tailor the model to its specific needs, overcome challenges such as resistance to change, and ensure clear communication among stakeholders. Ultimately, the BSC has the potential to significantly enhance the efficiency and transparency of public enterprises, but only with careful planning and sustained managerial support (Northcott & Taulapapa, 2012).

3. Research Methodology and Data Sources

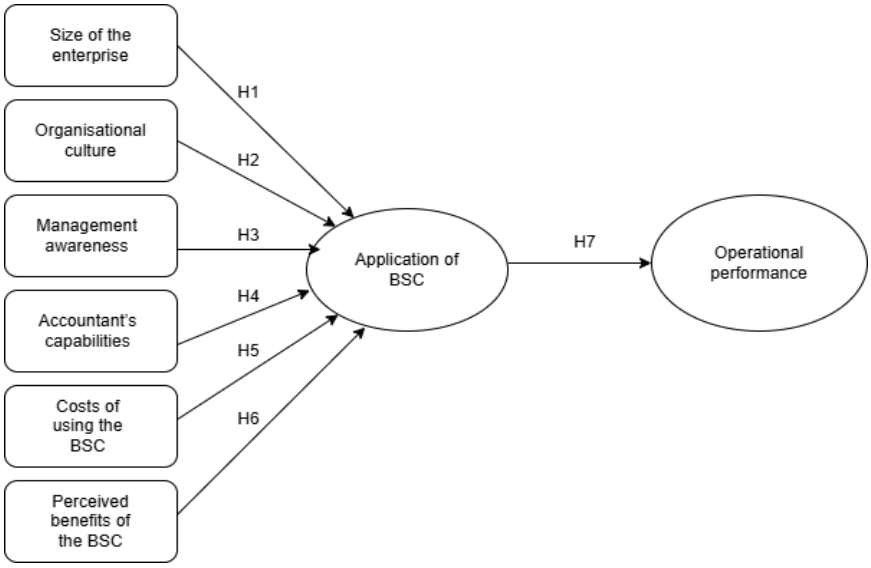
The research was conducted using an online questionnaire distributed to selected public enterprises in the Federation of Bosnia and Herzego-

vina (FBiH). The enterprises were identified through the website of the non-profit organisation Centers for Civic Initiatives, which was the first to register a comprehensive map of public enterprises in Bosnia and Herzegovina. The register (Odgovorno.ba, 2025) includes 554 public enterprises, which constituted the research population. The research sample comprised 138 respondents employed in the selected enterprises, specifically those working in accounting and finance departments, as well as employees with specialised knowledge in strategic management. The questionnaire was sent to all public enterprises in the FBiH listed on the aforementioned map.

The questionnaire consisted of two sections. The first section gathered the demographic characteristics of the respondents. The second section included selected research scales: size of the enterprise, organisational culture, management awareness, accountants' capabilities, costs of using the BSC, perceived benefits of BSC use, BSC adoption, and operational performance. The survey comprised 34 items, evaluated using a five-point Likert scale, where 1 = strongly disagree; 2 = disagree; 3 = neither agree nor disagree; 4 = agree; 5 = strongly agree.

Data analysis was conducted using correlation and regression analyses. The research model is presented in Figure 1. A total of seven hypotheses were tested in this study, as outlined below.

Figure 1: *Research model*



Source: Authors.

H1: The size of the public enterprise has a positive influence on the implementation of the BSC model.
H2: Organisational culture has a positive influence on the implementation of the BSC model.
H3: Management awareness has a positive influence on the implementation of the BSC model.
H4: The capabilities and qualifications of accountants positively influence the implementation of the BSC in enterprises.
H5: The costs of using the BSC have a positive influence on its implementation in enterprises.
H6: The perceived benefits of BSC use have a positive influence on its implementation in enterprises.
H7: The implementation of the BSC has a positive influence on operational performance in enterprises.

4. Research Results and Discussion

The research sample consisted of 138 respondents, representing a 92% response rate. Out of the total respondents, 58 were male (42.03%) and 80 were female (57.97%). Regarding the age structure, the majority – 61 individuals (44.20%) – were between 36 and 45 years old. A total of 49 respondents (35.51%) were aged between 46 and 55, while 16 respondents (11.59%) were aged between 26 and 35. Additionally, 10 respondents (7.25%) were between 56 and 65 years old.

With respect to the positions held within the enterprises, 65 respondents (47.10%) worked in strategic management roles, while 73 employees (52.90%) were engaged in accounting.

The reliability of the measurement instrument was tested using Cronbach's alpha for each individual construct or scale. The results indicated values above 0.7 for all constructs, leading to the conclusion that the measurement instrument is reliable. The Cronbach's alpha coefficient ranged from 0.703 (for the operational performance scale) to 0.971 (for the organisational culture scale) (Table 1).

Table 1: *Reliability of the measurement instrument*

Scale	Cronbach's alpha	Number of items
Size of the enterprise	.799	5
Organisational culture	.971	3
Management awareness	.736	4
Accountants' capabilities	.706	5
Costs of using the BSC	.879	5
Perceived benefits of BSC use	.781	3

Implementation of the BSC	.790	4
Operational performance	.703	5

Source: Authors' own elaboration based on collected research data.

To test the normality of the data distribution, both the Kolmogorov–Smirnov and Shapiro–Wilk tests were employed. According to the results presented in Table 2, the p-value was less than 0.05, indicating that the data were not normally distributed. It is important to note that data collected using Likert-type scales are rarely normally distributed.

Table 2: *Normality of data distribution*

Variable	Kolmogorov-Smirnov statistic	Degrees of freedom	Statistical significance	Shapiro-Wilk statistic	Degrees of freedom	Statistical significance
Implementation of the BSC	.385	3	.000	.750	3	.000
	.435	7	.000	.600	7	.000
	.478	10	.000	.539	10	.000
	.492	11	.000	.486	11	.000
	.539	23	.000	.215	23	.000
	.475	22	.000	.522	22	.000
	.310	18	.000	.784	18	.001
	.298	35	.000	.830	35	.000

Source: Authors' own elaboration based on collected research data.

The problem of multicollinearity is characteristic of multiple linear regression. Its presence in a regression model implies the existence of a complete or approximate linear correlation among the independent variables. Since multicollinearity is an issue related to the sample rather than the population, there is no test to confirm its existence. However, several methods can help detect this problem. The approximate degree of multicollinearity can be assessed using indicators such as the Variance Inflation Factor (VIF) and tolerance (TOL). Based on the results in Table 3, it is evident that for all variables, the TOL values are greater than 0.1 and all VIF values are less than 10, leading to the conclusion that none of the variables pose a multicollinearity problem (Table 3).

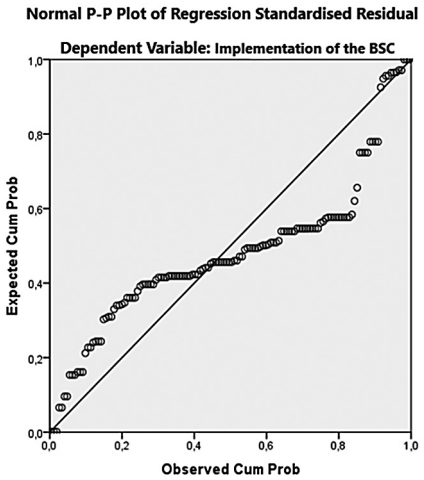
Table 3: *Multicollinearity*

Coefficients													
Model		Unstandardised coefficients		Standardised coefficients	*t*	Statistical significance	95,0% confidence interval for B		Correlations			Collinearity statistics	
		B	Standard error	Beta coefficient			Lower bound	Upper bound	Intercept	Partial	Part	Tolerance	VIF
1	Constant	.223	.116		1.929	.056	-.006	.452					
	Accountants' capabilities	.935	.027	.949	35.092	.000	.882	.987	.949	.949	.949	1.000	1.000
2	Constant	.672	.126		5.337	.000	.423	.920					
	Accountants' Capabilities	.884	.025	.898	35.379	.000	.835	.934	.949	.950	.848	.893	1.120
	Costs of using the BSC	-.064	.010	-.156	-6.165	.000	-.085	-.044	-.450	-.469	-.148	.893	1.120
3	Constant	.971	.158		6.134	.000	.658	1.284					
	Accountants' capabilities	.876	.024	.889	35.829	.000	.828	.924	.949	.952	.835	.881	1.135
	Costs of using the BSC	-.069	.010	-.167	-6.708	.000	-.089	-.049	-.450	-.501	-.156	.874	1.144
	Operational performance	-.058	.020	-.070	-2.980	.003	-.097	-.020	-.112	-.249	-.069	.974	1.026
4	Constant	1.273	.208		6.120	.000	.862	1.685					
	Accountants' capabilities	.833	.031	.846	26.800	.000	.772	.894	.949	.919	.616	.530	1.885
	Costs of using the BSC	-.052	.013	-.126	-4.093	.000	-.077	-.027	-.450	-.335	-.094	.555	1.803
	Operational performance	-.057	.019	-.069	-2.950	.004	-.095	-.019	-.112	-.248	-.068	.973	1.028
	Size of the enterprise	-.052	.024	-.085	-2.196	.030	-.099	-.005	-.733	-.187	-.050	.349	2.869
a. Dependent variable: implementation of the BSC													

Source: Authors' own elaboration based on collected research data.

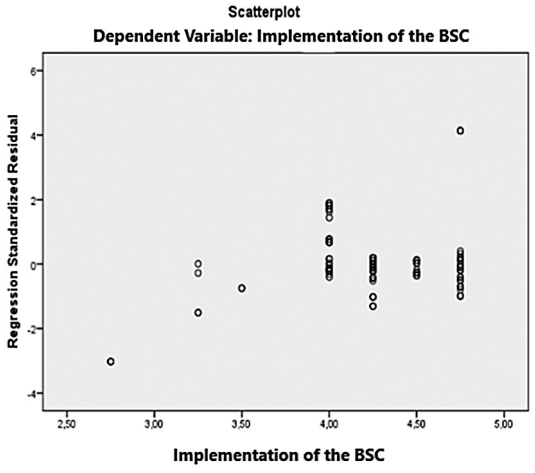
The distribution of data, specifically the standardised regression residuals and scatter plot, is shown in Graphs 1 and 2.

Graph 1: *Standardised residuals*



Source: Authors' own elaboration based on collected research data.

Graph 2: *Scatter plot*



Source: Authors' own elaboration based on collected research data.

According to the results, the value of the unstandardised coefficient B1 for the predictor variable "accountants' capabilities" was 0.935. This result implies

that a capable, qualified accountant increases the likelihood of implementing the BSC in public enterprises by 93.5%. Furthermore, the value of the B_1 coefficient for the predictor variables "accountants' capabilities" and "costs of using the BSC" was 0.884 and -0.64, respectively. This indicates that a capable, qualified accountant positively influences BSC implementation, whereas the costs of implementing the BSC negatively affect its adoption by 64%.

The predictor variables "operational performance" and "costs of using the BSC" had negative signs for the unstandardised coefficient B_1. This result indicates that any increase in costs reduces the likelihood of BSC implementation by 69%, while decreased operational performance reduces the likelihood of BSC implementation by 58%.

A similar result was observed for the variable "size of the enterprise," where the findings indicated that the larger the enterprise, the lower the likelihood of BSC implementation. Each of the independent variables was statistically significant, as $p < .05$ (Table 3).

Multiple regression provides a model that includes all the variables with which the analysis began, regardless of their different significance, and even in cases where significant multicollinearity is present. Stepwise regression helps address multicollinearity issues by removing independent variables of low significance. When multicollinearity is high, many variables have similar meanings, so it is not necessary for all of them to be included in the model. Stepwise regression allows for the elimination of overlapping variables, which consequently contribute little or nothing to the model's predictive accuracy. This approach results in a new model with fewer independent variables that is just as efficient as a model containing all the independent variables.

According to the results in Table 4, the variables included in the model are accountants' capabilities, costs of using the BSC, operational performance, and the size of the enterprise.

Table 4: *Variables included in the model*

Variables included/excluded from the model			
Model	**Variables included in the model**	**Variables excluded from the model**	**Method**
1	Accountants' capabilities		Stepwise (criteria: probability- of-F-to-enter ≤ .050, probability-of-F-to-remove ≥ .100).

2	Costs of using BSC		Stepwise (criteria: probability- of-F-to-enter ≤ .050, probability-of-F-to-remove ≥ .100).
3	Operational performance		Stepwise (criteria: probability- of-F-to-enter ≤ .050, probability-of-F-to-remove ≥ .100).
4	Size of the enterprise		Stepwise (criteria: probability- of-F-to-enter ≤ .050, probability-of-F-to-remove ≥ .100).
a. Dependent variable: implementation of the BSC			

Source: Authors' own elaboration based on collected research data.

The results of the regression analysis (Table 5) indicate that each subsequent model improves upon the previous one, as the values of *R* and R^3 gradually increase.

- Model 1 explains 90.1% of the variance in the dependent variable (implementation of the BSC) solely based on the capability of accountants.
- By adding the costs of using the BSC to Model 2, the explained variance increases to 92.2%, accompanied by a decrease in the standard error of the estimate.
- Model 3 further includes operational performance, causing R^3 to rise to 92.7%, and the model becomes more precise.
- Finally, Model 4 incorporates the size of the enterprise, achieving an R^3 of 93%, with the lowest standard error of the estimate (0.10993), indicating a high level of predictive precision.

Table 5: *Summary of multiple linear regression models*

Model	*R*	R^3	Adjusted R^3	Standard error of the estimate	Durbin-Watson
1	.949a	.901	.9	.12936	
2	.960b	.922	.921	.11469	
3	.963c	.927	.926	.11149	
4	.964d	.93	.928	.10993	.31

a. Predictor: (constant), accountants' capabilities
b. Predictor: (constant), accountants' capabilities, costs of using the BSC
c. Predictor: (constant), accountants' capabilities, costs of using the BSC, operational performance

d. Predictor: (constant), accountants' capabilities, costs of using the BSC, operational performance, size of the enterprise
e. Dependent variable: implementation of the BSC

Source: Authors' own elaboration based on collected research data.

Correlations represent another output within the multiple linear regression model. The Pearson correlation coefficient is utilised for interval-scale variables that are linearly related and can range from -1 to +1. According to the results presented in Table 6, the variables size of the enterprise and implementation of the BSC demonstrate a statistically significant linear relationship ($p < .05$). In terms of direction and strength, the relationship is moderately strong and positive ($r = .733$), indicating that larger enterprises are more likely to implement the BSC. The relationship between organisational culture and the implementation of the BSC was not statistically significant ($p > .05$). However, a statistically significant linear relationship was observed between management awareness and implementation of the BSC, reflecting a moderately strong positive association ($r = .508$). This suggests that higher levels of management awareness correspond to a greater likelihood of implementing the BSC.

Furthermore, a statistically significant linear relationship was found between the accountants' capabilities and implementation of the BSC, with an exceptionally strong positive correlation ($r = .949$). This suggests that personnel with adequate qualifications and an understanding of management accounting, including the BSC, substantially increase the likelihood of its implementation. A statistically significant linear relationship was also found between the costs of using the BSC and its implementation, although in this case the correlation is weak and negative ($r = -.450$), indicating that higher implementation costs reduce the likelihood of adoption. The relationship between perceived benefits of BSC use and the implementation of the BSC was statistically significant and moderately strong in a positive direction ($r = .573$). Similarly, a statistically significant and moderately strong positive correlation ($r = .612$) was observed between operational performance and implementation of the BSC, indicating that implementation of the BSC positively influences the operational performance of public enterprises (Table 6).

It is important to note the apparent discrepancy between the positive bivariate correlations (e.g., size of the enterprise: $r = .733$; operational performance: $r = .612$) and the negative regression coefficients observed in the multiple regression model ($\beta = -.052$ and $\beta = -.057$, respectively). This phenomenon occurs because correlation measures the isolated rela-

tionship between two variables, whereas regression coefficients represent partial effects when controlling for all other predictors in the model. Given the strong negative correlation between the size of the enterprise and accountants' capabilities (r = -.670), and the dominant predictive power of the accountants' capabilities (β = .846), the unique contribution of enterprise size, after accounting for workforce qualifications, becomes negligible or slightly negative. In essence, the positive bivariate relationship between size and BSC implementation is largely mediated by competency-related factors. Once these factors are controlled, the residual effect of size becomes negative.

Table 6: *Correlations*

		Correlations							
		Implementation of the BSC	Size of the enterprise	Organisational culture	Management awareness	Accountants' capabilities	Costs of using the BSC	Perceived benefits of BSC use	Operational performance
Pearson correlation coefficient	Implementation of the BSC	1.000	.733	.055	.508	.949	-.450	.573	.612
	Size of the enterprise	.733	1.000	.278	.390	-.670	.644	.350	-.001
	Organisational culture	.055	.278	1.000	.395	.196	.656	.385	-.167
	Management awareness	.508	.390	.395	1.000	.564	-.091	.321	.222
	Accountants' capabilities	.949	-.670	.196	.564	1.000	-.327	-.173	-.068
	Costs of using the BSC	-.450	.644	.656	-.091	-.327	1.000	.567	-.115
	Perceived benefits of BSC use	.573	.350	.385	.321	-.173	.567	1.000	.277
	Operational performance	.612	-.001	-.167	.222	-.068	-.115	.277	1.000
Statistical significance	Implementation of the BSC		.000	.260	.000	.000	.000	.001	.096
	Size of the enterprise	.000		.000	.000	.000	.000	.000	.496
	Organisational culture	.260	.000		.000	.010	.000	.000	.025
	Management awareness	.000	.000	.000		.000	.144	.000	.004
	Accountants' capabilities	.000	.000	.010	.000		.000	.021	.214
	Costs of using the BSC	.000	.000	.000	.144	.000		.000	.090
	Perceived benefits of BSC use	.001	.000	.000	.000	.021	.000		.001
	Operational performance	.026	.496	.025	.004	.214	.090	.001	

N	Implementation of the BSC	138	138	138	138	138	138	138	138
	Size of the enterprise	138	138	138	138	138	138	138	138
	Organisational culture	138	138	138	138	138	138	138	138
	Management awareness	138	138	138	138	138	138	138	138
	Accountants' capabilities	138	138	138	138	138	138	138	138
	Costs of using the BSC	138	138	138	138	138	138	138	138
	Perceived benefits of BSC use	138	138	138	138	138	138	138	138
	Operational performance	138	138	138	138	138	138	138	138

Source: Authors' own elaboration based on collected research data.

The results of the ANOVA testing (Table 7) for all four regression models indicate that the models are statistically significant:

– The *F*-statistic values are exceptionally high across all models (e.g., 1,231.465 in Model 1, up to 440.146 in Model 4), with a p-value of 0.000, indicating a significant relationship between the set of predictors and the dependent variable (implementation of the BSC).
– As the models are expanded by adding new predictors, the regression sum of squares increases while the residual sum of squares decreases, confirming that the additional predictors improve the model and contribute to the explanation of variance.
– Although the *F* value decreases across the models – as expected due to the increasing number of predictors – all models remain highly significant, indicating a strong linear relationship between the independent variables and the implementation of the BSC.

Table 7: *ANOVA analysis of variance*

ANOVA						
Model		Sum of squares	Degrees of freedom	Mean square	F	Statistical significance
1	Regression	20.607	1	20.607	1231.465	.000[b]
	Residual	2.276	136	.017		
	Total	22.883	137			
2	Regression	21.107	2	10.553	802.264	.000[c]
	Residual	1.776	135	.013		
	Total	22.883	137			
3	Regression	21.217	3	7.072	569.020	.000[d]
	Residual	1.665	134	.012		
	Total	22.883	137			
4	Regression	21.275	4	5.319	440.146	.000[e]
	Residual	1.607	133	.012		
	Total	22.883	137			

a. Dependent variable: implementation of the BSC

b. Predictor: (constant), accountants' capabilities
c. Predictor: (constant), accountants' capabilities, costs of using the BSC
d. Predictor: (constant), accountants' capabilities, costs of using the BSC, operational performance
e. Predictor: (constant), accountants' capabilities, costs of using the BSC, operational performance, size of the enterprise

Source: Authors' own elaboration based on collected research data.

Based on the results of the research, the following hypotheses are accepted: H1, H4, H5, and H7. The hypotheses that were not confirmed are H2, H3, and H6.

The first initial hypothesis of the study, which stated that the size of a public enterprise (organisation) has a positive impact on the implementation of the BSC model, was confirmed. In other words, the size of the enterprise has an active influence on the application of the BSC. This result is consistent with the findings of studies conducted by Hoque and James (2000), Quesado, Guzmán, and Rodrigues (2013), and Koske and Muturi (2015). Large public enterprises possess high potential for economic efficiency but are also complex and demanding to manage. Due to these characteristics, such enterprises require solutions to enhance the efficiency of their operations. In this context, a system such as the BSC meets the requirements in terms of managing and evaluating operational results in large enterprises (Nhi & Toan, 2018).

The second initial hypothesis of the study, which stated that organisational culture has a positive impact on the implementation of the BSC model, was not accepted, as previously explained. The likely reason for this is the presence of uniform responses, where a large number of respondents assigned identical ratings across the items. On the other hand, the descriptive statistics for the organisational culture scale indicated that respondents rated all items of this scale above the average. The results suggest a high level of consensus within the organisation regarding shared goals, as well as administrative support for employees and interdepartmental collaboration. However, other studies, such as those by Tran (2016) and Nguyen (2013), established that organisational culture inevitably has a positive impact on the implementation of the BSC model. Specifically, when implementing a new system like the BSC, it is essential to have employee consensus in order to create motivation to overcome challenges. Moreover, support from top management will enable employees to feel confident when using a complex and new system like the BSC (Nhi & Toan, 2018).

The third initial hypothesis, which stated that management awareness has a positive impact on the implementation of the BSC, was also not confirmed for the previously mentioned reasons. One of the reasons for the failure to confirm this hypothesis lies in the fact that the mean score for the statement "managers highly value the benefits of using the BSC" was lower than the average. The other two statements on this scale, however, had mean scores above the average: "managers understand and comprehend the BSC" and "managers have high demands for implementing the BSC." Nevertheless, other studies, such as those by Tanyi (2011) and Tran (2016), confirmed that management awareness has a positive impact on the implementation of the BSC. The authors state that public enterprises typically have a complex structure, which makes it difficult to assess operational outcomes. Therefore, such enterprises require the implementation of the BSC. Furthermore, they argue that a better understanding of the BSC system will improve its application in assessing operational results (Tanyi, 2011; Tran, 2016).

The fourth initial hypothesis of the study, which stated that the capabilities and qualifications of accountants positively influence the implementation of the BSC in enterprises, was confirmed. When accountants in public enterprises possess the necessary qualifications and knowledge of the BSC, they are more likely to participate in additional training to enhance their skills. They will also be capable of consulting other specialised enterprises on accounting matters. This has a significant impact on the implementation of the BSC. These conclusions were also reached by Le et al. (2020) in their study on the factors influencing the application of the BSC in SMEs. Accountants with high capabilities will be familiar with and understand models for assessing operational outcomes, such as the BSC, and this will result in an easier implementation of the BSC (Nhi & Toan, 2018).

The fifth initial hypothesis of the study, which stated that the costs of using the BSC have a positive impact on its implementation in enterprises, was also confirmed. Every enterprise should conduct a cost-benefit analysis when implementing the BSC. As long as the enterprise manages to reduce these costs to the most acceptable level, this will result in higher chances of BSC implementation. This result aligns with findings by Koske and Muturi (2015), Tran (2016), and Le et al. (2020). The implementation of the BSC requires relatively high operational costs. Therefore, reducing these costs as much as possible will increase the likelihood of successful implementation of the BSC.

The sixth initial hypothesis of the study, which stated that the benefits of using the BSC have a positive impact on the implementation of the BBC in enterprises, was not confirmed. Once again, this issue is related to uniform ratings, and the result is consistent with the lowest mean value for the statement: "managers highly value the benefits of using the BSC." Other studies on this topic have established that the benefits of using the BSC do indeed have a positive impact on its implementation (Koske and Muturi, 2015; Tran, 2016; Le et al., 2020; Jackson, 2024). The authors argue that the BSC offers a wide range of advantages that can significantly improve strategic planning and operational efficiency in public enterprises by strengthening competitiveness. It is an effective tool for improving communication, decision-making, and service delivery from the customer's perspective (Koske and Muturi, 2015; Tran, 2016; Le et al., 2020; Jackson, 2024). It is important to note that the mean score for all items of this scale was above average.

The seventh initial hypothesis of the study, which stated that the implementation of the BSC has a positive impact on operational performance in enterprises, was confirmed. Similar results were obtained by Thuong and Singh (2023), who found in their research that operational performance in enterprises has a statistically significant impact on the implementation of the BSC.

5. Conclusion

The purpose of this study is to examine the influence of organisational, human, and economic factors on the implementation of the Balanced Scorecard (BSC) model in public enterprises. By testing seven hypotheses, the research provides deeper insights into the prerequisites, opportunities, and barriers associated with the adoption of this performance management system. The results demonstrate that the size of the enterprise, accountants' capabilities, the costs of using the BSC, and its connection to operational performance exert a statistically significant and positive effect on adoption. Larger enterprises with more developed capacities and resources are naturally more inclined to adopt complex management tools, while the expertise of professional accountants facilitates their integration. Furthermore, the perceived cost-effectiveness of the BSC and its contribution to operational improvements represent additional incentives for implementation. In contrast, hypotheses related to organisational cul-

ture, management awareness, and perceived benefits of BSC use were not supported. Although descriptive statistics indicate generally favourable attitudes, the lack of variability in responses limited the ability to confirm their actual influence. Nevertheless, prior research highlights the relevance of these factors, suggesting the need for further exploration.

The findings contribute to a better understanding of the determinants of BSC adoption in the public sector, emphasising that successful implementation of the BSC requires the synergy of adequate structural capacities, qualified human resources, and financial justification. The results also underline the importance of strengthening management awareness and fostering organisational culture to ensure sustainable and effective use of the BSC model.

This study is subject to certain limitations. Firstly, the analysis was based exclusively on survey results, while internal organisational elements that may influence the potential for applying the BSC model were not taken into account. Among these elements, particular importance is attached to properly established processes, leadership support, and the existence of other support systems, such as IT systems for BSC implementation. Furthermore, the number of respondents per institution was limited, and their professional backgrounds and positions within the organisation may have affected the homogeneity of responses.

Future research should refine the applied measurement scales by incorporating items specifically tailored to the characteristics of public enterprises. In addition, expanding the sample size would enable the use of advanced statistical techniques, such as Structural Equation Modelling (SEM), thereby providing more comprehensive insights into the relationships among the examined factors.

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FACTORS OF SUCCESSFUL IMPLEMENTATION OF THE BALANCED SCORECARD MODEL IN PUBLIC ENTERPRISES

Summary

The research examines the determinants influencing the implementation of the Balanced Scorecard (BSC) in public enterprises within the Federation of Bosnia and Herzegovina. The study is based on data collected from 138 respondents working in finance, accounting, and strategic management, and evaluates seven hypotheses to capture organisational, human, and economic factors that may drive or hinder adoption. Empirical results indicate that the size of the enterprise, the capabilities of professional accountants, the financial costs of using the BSC, and its demonstrated connection with operational performance significantly influence adoption decisions. Public enterprises with stronger capacities, adequate staffing, and available resources are more likely to integrate this model, and the perception of its cost-effectiveness further facilitates acceptance. Conversely, organisational culture, management awareness, and perceived benefits were not confirmed as influential factors in this sample, which may reflect the limited variability of responses rather than their actual irrelevance.

Overall, the findings suggest that successful implementation of the BSC requires the alignment of financial feasibility, professional expertise, and institutional capacity. Strengthening leadership engagement and cultivating a supportive organisational culture are also identified as important conditions for long-term effectiveness. By providing evidence from the public sector in Bosnia and Herzegovina, this study contributes to the literature on performance management and underscores both the opportunities and challenges associated with applying the BSC.

Keywords: *Balanced Scorecard, public enterprises, implementation, operational performance, management*

ČIMBENICI USPJEŠNE PRIMJENE MODELA BALANCED SCORECARD U JAVNIM PODUZEĆIMA

Sažetak

Istraživanje se bavi čimbenicima koji oblikuju primjenu modela Balanced Scorecard (BSC) u javnim poduzećima u Federaciji Bosne i Hercegovine. Studija se temelji na podacima prikupljenima od 138 ispitanika zaposlenih u sektorima financija, računovodstva i strateškog menadžmenta te provjerava sedam hipoteza kako bi obuhvatila organizacijske, ljudske i ekonomske čimbenike koji mogu unaprijediti ili otežavati primjenu BSC-a. Empirijski rezultati pokazuju da veličina poduzeća, kompetencije profesionalnih računovođa, financijski troškovi primjene BSC-a te njegova dokazana povezanost s organizacijskom izvedbom značajno utječu na odluke o njegovu uvođenju. Javna poduzeća s jačim kapacitetima, odgovarajućim kadrovima i raspoloživim resursima sklonija su integraciji ovog modela, dok percepcija njegove troškovne učinkovitosti dodatno olakšava prihvaćanje. Suprotno tome, organizacijska kultura, svijest menadžmenta i percipirane koristi nisu potvrđeni kao značajni čimbenici u ovom uzorku što može odražavati ograničenu varijabilnost odgovora, a ne njihovu stvarnu nevažnost. Općenito, rezultati upućuju na to da uspješna primjena BSC-a nije moguća bez usklađivanja financijske održivosti, stručne ekspertize i institucionalnih kapaciteta. Jačanje uključenosti vodstva i razvoj poticajne organizacijske kulture također se ističu kao važni uvjeti dugoročne učinkovitosti. Pružajući empirijske dokaze iz javnog sektora Bosne i Hercegovine, ovaj rad obogaćuje literaturu o upravljanju učinkom te ukazuje na mogućnosti i izazove u primjeni BSC-a.

Ključne riječi: *Balanced Scorecard, javna poduzeća, primjena, organizacijska izvedba, menadžment*