RESEARCH IMPLICATIONS FOR USEFULNESS OF BALANCED SCORECARD: THE CASE OF SOUTH KOREAN FIRMS

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ABSTRACT

Balanced scorecard (BSC) is a management performance metric that has evolved from an existing method of measuring management performance based solely on the existing financial perspective to the measurement and management of four aspects of companies: customer, internal processes, finance, and learning and growth. Worldwide, BSC has been applied to private companies, followed by public corporations. In the case of South Korea, however, it was first applied by the government to public institutions, as required by the International Monetary Fund (IMF), and was then actively introduced to private companies. In this paper, the usefulness of BSC is examined, and policy implications are proposed. This study was an empirical analysis of how financial performance, customer performance, process performance, and education and learning performance-the four indicators of BSC performance-affect the four aforementioned aspects of enterprises. Towards this end, 30 public enterprises in South Korea were surveyed, and data from 23 of them were retrieved, with a 76.7% recovery rate. Each of the variables in the set model was measured based on a 7-point Likert scale. Technical statistical, correlation, and regression analyses were conducted to verify the model characteristics and the study hypotheses and variables. It was found that BSC performance has a positive correlation with the four aforementioned aspects of enterprises, and that there is a statistically significant positive correlation between the study variables.

Keywords: South Korea, Balanced Scorecard, Mission, Strategy, Customer, Internal Process, Learning and Growth Perspective, Finance.

INTRODUCTION

With the occurrence of economic growth and rapid industrial development, the importance of management performance measurement began to increase further for the achievement of goals through systematic management performance. To improve competitiveness, all organizations need a management performance measurement system whose results can be made the bases of a compensation system for managers and for which the managers can be held accountable for the organization's poor performance through the accurate measurement of their own performance (Lipe & Salterio, 2000). A number of studies have thus been conducted regarding balanced scorecard (BSC), a management performance metric, and such studies can be divided into four main categories: (i) studies on conceptual frameworks and techniques for introducing a management performance measurement system; (ii) studies that explain how BSC actually operates; (iii) studies on the operation of BSC and its effectiveness; and (iv) verification studies on the various factors affecting BSC. In the case of a management performance measurement system, specific goals are shared with the organization's members to achieve the organization's strategic goals, and efficiency is maximized. The results of the said measurement system are also utilized for compensation (personnel evaluation and performance pay) and punishment purposes.

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Organizations have different personnel systems, organizational cultures, and management environment standards. In the early 1980s, discussions and introduction of management performance measurement systems began as essential conditions for the survival and sustained growth of organizations in a rapidly changing environment, centered on major Organisation for Economic Co-operation and Development (OECD) countries. The same also began in the private sector, and its management performance measurement techniques were spread to the public sector. Among the several such techniques, such as management-based object (MBO) and total quality management (TQM), BSC is a new technique for management performance measurement developed by Kaplan and Norton (1992) based on the recognition that it was unfit to enter a highly information-based age with only the financial metrics existing then. Kaplan and Norton (1993) defined BSC as a strategic system for long-term performance as well as a tactical or performance measurement system. Based on the initial concept, BSC evolved from an early performance measurement system to a strategic management system through the process of continuous improvement and supplementation. The conceptual development of BSC is shown in Figure 1.

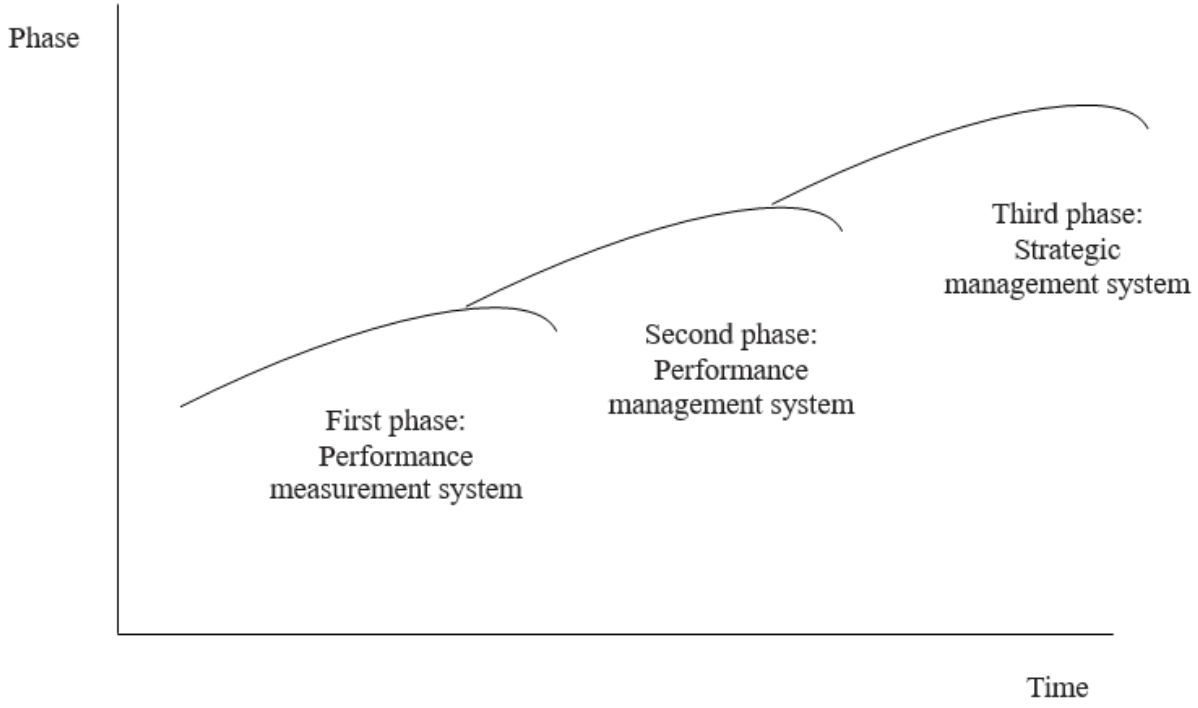

FIGURE 1

CONCEPTUAL DEVELOPMENT OF BSC

The critical recognition of strategic segments is the latest change in the competitive business environment, in which effective implementation of the strategy is difficult. The role of BSC in the process of establishing a strategic management system is emphasized; that is, both financial and non-financial metrics should be included in the information system for all the members of an organization during the communication and connection process (Kaplan & Norton, 1996). Of the various factors that make up all BSC management performance measurement systems, the indicators should be part of the component for all the organizational members. This shows that the different aspects of a company are correlated with and influence the members of the organization, who in turn have receptivity. BSC uses four perspectives to

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identify the causality of the various factors affecting organizational performance, and to construct a balanced performance indicator. Kaplan and Norton (1996) argued that BSC's basic view was derived in a balanced way from the finance, customer, internal-process, and learning and growth perspectives. While many existing companies then focused on short-term growth through financial management, BSC has the advantage of focusing on long-term growth through non-financial indicator management. As the BSC results are intended to enable a company to achieve its vision and strategy, they are linked to evaluation and reward. Therefore, companies that are using key performance indicators (KPIs) need to have performance management professionals to ensure fairness among companies, and need to manage the systematic criteria and deliverables. The current management system establishes and operates key strategies for achieving the company's vision, and the core strategy takes into account the changing business environment. The structure of manuscript is consist of introduction, literature review, concept of BSC, BSC components and scheme, action principles for organizational strategy, research design and method, research analysis results, research implications and limitations, and conclusions.

REVIEW LITERATURE

The BSC was originally introduced for the private sector by Norton and Kaplan in 1992, in response to a failure of purely monitoring financial indicators. The balanced score card considers economic and non-economic factors, often denoted as "soft" (Smandek et al., 2010). The research results show that High-Tech firms implement the BSC model more than Low-Tech firms do (Kremer, 2013). One recently developed performance measurement method which may prove more effective for management is that of the "balanced score-card" which aims to give management a "comprehensive but quick" view of their organization′s performance (Brown & McDonnell, 1995). The performance measurement system (PMS) is done based on balanced scorecard (BSC) concept (Oey & Mulianti, 2017). The BSC identifies this framework as a strategic measurement and management system for facilities management (Amaratunga et al., 2002). The BSC covers the environmental and social perspectives, enabling firms to evolve relevant strategy (Chaklader & Roy, 2010). The development of Knowledge Management theory in recent years has been largely dominated by disputes over what outcomes organizations might expect to achieve (Welch & Alhamoudi, 2008). The BSC is widely acknowledged to have moved beyond the original ideology (Gawankar et al., 2015). BSC makes it possible to establish a model in the profit organization, so that the strategic aspects of the observed set relevant objectives and include features that will be measured (Pravdić & Kučinar, 2015). The BSC helps managers to evaluate SCM performance in a much-balanced way from all angles of business (Bhagwat & Sharma, 2007). Using financial and non-financial measures, the BSC appraises four dimensions of performance: customers, financial (or shareholders), learning and growth, and internal aspects (Hoque & James, 2000). The Balanced Scorecard of Kaplan and Norton is a management tool that supports the successful implementation of corporate strategies. It has been discussed and considered widely in both practice and research (Figge et al., 2002). Recent approaches to performance measurement have identified the inadequacies of solely relying on quantitative and short-term indicators, and have led to the development of frameworks (Ruggero et al., 2013). Companies in the engineering industry that have introduced the Balanced Scorecard methodology consider non-financial indicators in their management being important (Benková et al., 2020). The BSC is as designed and implemented, is an effective device for controlling corporate strategy (Malina & Selto, 2001). At a time of increasing competition and globalisation; shorter lead times and increased customer sophistication, the effectiveness of strategy implementation is even more

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important (Atkinson, 2006). The changes of BSC made have improved the utility of the balanced scorecard as a strategic management tool (Lawrie & Cobbold, 2004). The Balanced Scorecard (BSC) has studied whether its adoption generates greater integration between financial and nonfinancial performance measures, supports strategy implementation, increases performance and improves strategic decision making (Busco & Quattrone, 2015). The concept of entrepreneurship and insights are important for nature entrepreneurship (Radovic-Markovic & Salamzadeh, 2012). Supply chains replaced the traditional competition between the companies and shifted the modern business environment (Kumar et al., 2019). The research design using sequential explanatory strategy, this model of combination research give more higher weight to the use of quantitative research methods (Hastjarjo, 2015). The financial ability plays a major role in improving the cooperatives' performance (Krisnawati, 2019). Performance improvement is high on the agenda of many companies around the world and with the growing number of improvement models now available care has to be taken to adopt an approach that will yield the most attractive return on investment (Wongrassamee et al., 2003). The long-term survival of a business is dependent upon meeting market needs through a long-term value creation process (Sim & Koh, 2001). If more attention is paid to human resources management practices, corporate entrepreneurship will be improved accordingly (Salamzadeh et al., 2019). The Government-Linked Companies (GLCs) in strategizing ways to improve their risk disclosure practices, thus improving their transparency and accountability to their stakeholders (Darussamin et al., 2018). Rather than relying on the static BSC, it would be more effective to adopt a systemic perspective in measuring/managing intangible assets (Voelpel et al., 2006). Facilitating legislation and giving more authority to SME owners/managers for developing their enterprises are highly advised (Doshmanli et al., 2018). More specifically, the BSC improves the integration of the management processes and empowers people (Geuser et al., 2009). Many firms have adopted the Balanced Scorecard (BSC) as a way to implement strategy and measure firm performance (Crabtree & DeBusk, 2008). The balanced scorecard is intended not only as a strategic measurement system but also as a strategic control system which can align departmental and personal goals to overall strategy (Norreklit, 2000).

Concept of BSC

By maximizing the utilization of the various knowledge-based resources in the knowledge-information society, companies can maintain a continuous competitive advantage. Many companies can achieve high performance only if they integrate their tangible and intangible assets efficiently and apply these to their management systems. BSC was proposed by Kaplan and Norton as a key management technique for business operations. Since the 2000s, it has been rapidly becoming a key topic in the study of management performance, and has been greatly used in businesses. As BSC's basic view, Norton cites the learning and growth, internal-process, customer, and finance perspectives (Kaplan & Norton, 1992). BSC presents these as a source of organizational value or a set of strategic performance indicators. To implement BSC, various types of processes are combined to interact with one another. The basic perspectives for BSC are shown in Figure 2. Key success elements were extracted based on the principality and indicators of the four aforementioned perspectives. The interaction between the financial and non-financial perspectives was also shown by developing success factors in the direction of the company's strategy and goal (Kaplan & Norton, 1992). BSC is used as an essential means in modern global management systems because such systems are designed to be set in a certain direction for a company's strategy, vision, and goal.

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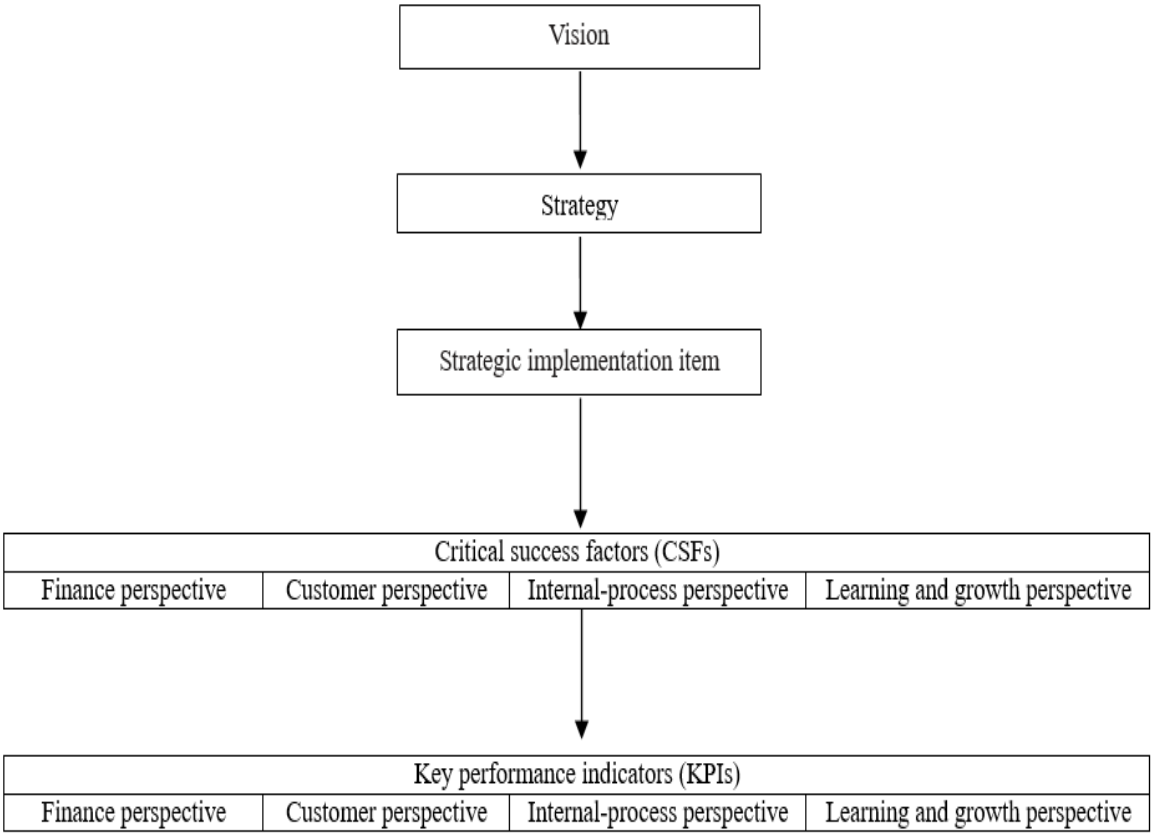

FIGURE 2

BASIC PERSPECTIVES FOR BSC

BSC Components and Scheme

BSC is a new strategic organizational management system that comprehensively measures the metrics derived from a company's vision, mission, and strategy and the customer, internal-process, learning and growth, and finance perspectives (Kaplan and Norton, 1992). Mission is the fundamental purpose of a company, its raison d'être, providing an ultimate direction that remains essentially unchanged and dictating the roles of the different employees of the company. Obviously, for a company to succeed in attaining its mission, such mission must be embraced by everyone in the company. Vision is the long-term goal and desirable future value that a company seeks. Strategy refers to methods and plans for achieving the vision. The key to the formation of a company strategy is the implementation of customer orientation and the creation of a competitive advantage. Below are the four main perspectives of BSC.

- First, how do the customers evaluate the company? (Customer perspective)
- Second, what should the company excel at to win the competition? (Internal-process perspective)
- Third, what will the company do to improve its continuous value and create new value? (Learning and growth perspective)
- Fourth, how do the stakeholders evaluate the company? (Financial perspective)

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The foregoing are the most essential components of BSC's strategic management system presented by Kaplan and Norton, and are the analytical frameworks that distinguish the performance factors (Kaplan & Norton, 1993). The most important component of BSC- key performance indicators (KPIs) based on different perspectives- represents the company's source of value creation. The customer perspective means the direction in which the company's effect on the customer increases. The internal-process perspective is an indicator of what a company will do internally, and the goal is to define which processes the company should excel in to achieve maximum performance. The learning and growth perspective pertains to understanding the company's potential and its competitiveness for the future, and is measured by indicators related to human, information, and organizational capital, such as the employees' capabilities, information system construction, and motivation. The finance perspective is a key part of the existing performance measurement system and is designed to show a company's performance to its main stakeholders, through financial indicators. The critical success factors (CSFs) are the solutions to the problem of what should be done to achieve a strategy. The KPIs involve setting up a measure to assess the achievement of the CSFs, and the strategy map is a description of a company's strategy based on the results of such assessment. The strategy map provides a conceptual framework for describing the basic components of the value creation process from the internal-process and learning and growth perspectives. The flow of the strategy is dynamically specified by causality, thus laying the basis for value creation. It also aligns the description and measurement of the intangible assets (human, information, and organizational assets) from a learning and growth perspective with a strategic process and the objectives from an internal-process perspective. Once the KPIs and targets are established, the necessary action plans are likewise established to achieve them (Kaplan and Norton, 1996).

Action Principles for Organizational Strategy

Organizations that have succeeded in introducing BSC have the following principles. First, the strategy should be changed to field expression. Second, the organization members must align themselves around the strategy. Third, the organizational members should be motivated to pursue the organization's strategy so that it will become a routine task for all of them. Fourth, the strategy must be managed to make it a continuous process. Fifth, through the leadership of the management, the organization should be transformed. A comprehensive and integrated management system that links strategic planning and planning with operational execution can be devised to organize the enterprise (Kaplan and Norton, 1996). The system consists of the following main phases. The first phase (strategy development) involves the managers' development of strategies using strategic tools. The second phase (strategy planning) involves planning strategies using strategic schematics and BSC's tools. The third phase (organization alignment) involves the manager's application of the strategic system and BSC to all the organizational units step by step to align the organization with the strategy. The fourth phase (operation planning) involves the use of tools like quality, process management, re-engineering, process dashboard, rolling forecast, activity-based cost calculation, capacity planning, and dynamic budget when all the organizational units and members are already aligned with the strategy. The fifth phase (monitoring and learning) involves beginning to carry out the strategy and operation plans, and the organization learning the problems, barriers, and challenges involved through close monitoring. The sixth phase (verification and coordination) involves starting a new cycle around the integrated strategic planning and operational implementation systems through internal operational data and new data on the external environments, competition, etc. The circular management system for the integrated management of the strategy and task is shown in Figure 3 (Kaplan et al., 2010).

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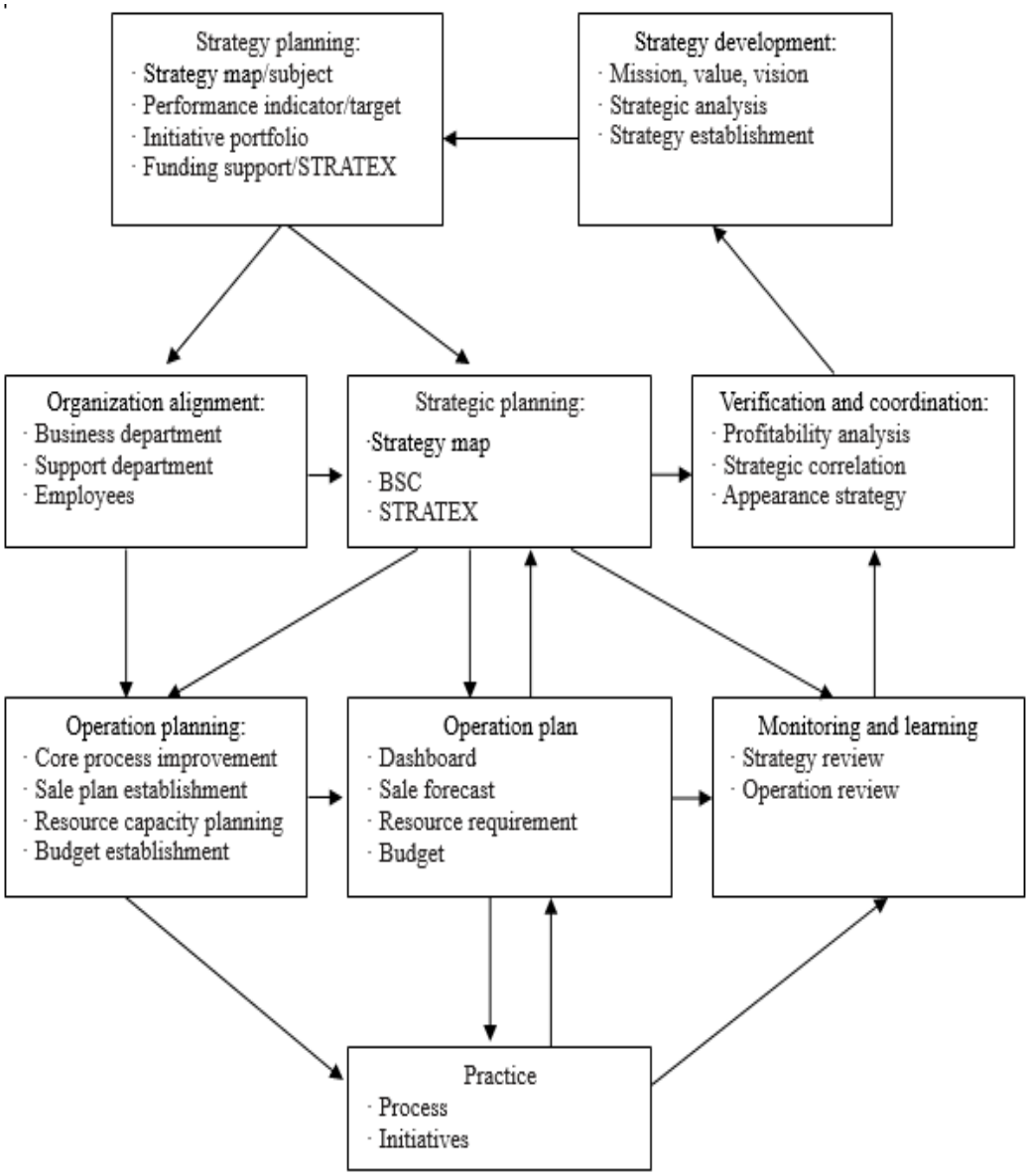

FIGURE 3

CIRCULAR MANAGEMENT SYSTEM FOR THE INTEGRATED MANAGEMENT OF THE STRATEGY AND TASK

RESEARCH DESIGN AND METHODS

The purpose of this study was to verify the usefulness of BSC and to suggest research implications. A research model was set up to verify the usefulness of BSC through an analysis of the financial performance, customer performance, process performance, and education and learning performance, and through an analysis of the relationship between BSC performance and its key elements (human, physical, and organizational factors). The human factor refers to the employees of the enterprise, who can be described in terms of their job training, experience, judgment, intelligence, and adaptability to a business organization, which can enhance the economic value of a company as a type of corporate capital. The physical factors are divided into tangible and intangible corporate resources, particularly financial components like cash

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equivalent to the tangible capital from a financial perspective, and tangible elements like machinery and buildings. The physical factors are closely linked to the timeliness, appropriateness, efficiency of input, and utilization of the material components as there is a justification for the company to obtain at least the required level as a continuing enterprise, and as the sources of such components are limited. Organizational elements play an important role in enhancing a company's performance as a final outcome, as a tangible component of the company. In a company, the individual elements with the same specific goal are grouped together through division and collaboration with a certain order.

The following hypotheses were established in this study:

Hypothesis A: Financial performance in BSC management performance will have a positive effect on the factors affecting a company's performance.

Hypothesis A-a: Financial performance will have a positive impact on the human factor.
Hypothesis A-b: Financial performance will have a positive impact on the physical factor.
Hypothesis A-c: Financial performance will have a positive impact on the organizational factor.

Hypothesis B: Customer performance in BSC management performance will have a positive effect on the factors affecting a company's performance.

Hypothesis B-a: Customer performance will have a positive impact on the human factor.
Hypothesis B-b: Customer performance will have a positive impact on the physical factor.
Hypothesis B-c: Customer performance will have a positive impact on the organizational factor.

Hypothesis C: Process performance in BSC management performance will have a positive effect on the factors affecting a company's performance.

Hypothesis C-a: Process performance will have a positive impact on the human factor.
Hypothesis C-b: Process performance will have a positive impact on the physical factor.
Hypothesis C-c: Process performance will have a positive impact on the organizational factor.

Hypothesis D: Education and learning performance in BSC management performance will have a positive effect on the factors affecting a company's performance.

Hypothesis D-a: Education and learning performance will have a positive impact on the human factor.
Hypothesis D-b: Education and learning performance will have a positive impact on the physical factor.
Hypothesis D-c: Education and learning performance will have a positive impact on the organizational factor.

In this study, each of the variables contained in a set model was measured based on a 7-point *Likert scale*. Technical statistical, correlation, and regression analyses were conducted to verify the characteristics of the variables and assumptions regarding them.

To elaborate on the analysis methods that were used in this study, first, technical statistical analysis was conducted to identify the mean and standard deviation as well as the human, physical, and organizational factors affecting a company's performance and the company's BSC management performance. Then Pearson correlation analysis was performed to identify the correlation between the variables in the analysis prior to hypothesis verification. This was followed by regression analysis, for verifying the assumptions that were set in this study. In this paper, 30 public enterprises in South Korea were surveyed, and the data from 23 of them were retrieved, with a 76.7% recovery rate.

RESEARCH ANALYSIS RESULTS

The results of the technical statistical analyses of the human, physical, and organizational factors affecting a company's performance and of the BSC management

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performance (financial, customer, process, and education and learning performances) are shown in Table 1. The mean and standard deviation of the measurement variables as well as the kurtosis and skewness show that the measurement variables were normal.

TABLE 1
RESULTS OF THE TECHNICAL STATISTICAL ANALYSIS OF THE MEASUREMENT VARIABLES

Variable	Mean	Standard deviation	Kurtosis	Skewness
Human factor	4.96	0.61	0.14	-0.10
Physical factor	5.91	0.58	-0.03	-0.33
Organizational factor	5.43	0.50	-0.12	-0.70
Financial performance	5.06	0.53	0.16	-0.91
Customer performance	5.10	0.51	-0.07	-0.59
Process performance	4.99	0.55	0.08	-0.18
Education and learning performance	5.48	0.47	-0.11	-0.87

Correlation analysis was conducted between BSC management performance and corporate performance. Correlation analysis calculates the Pearson's correlation coefficient to determine if the variables are correlated with each other. The minimum value of the Pearson correlation value is -1, and the maximum value is 1. If the value of the Pearson correlation coefficient between two variables is positive, the variables have a positive correlation with each other. If the value of the Pearson correlation coefficient between variables is negative, the variables have a negative correlation with each other. The correlation analysis results of the measurement variables in this study are shown in Table 2.

TABLE 2
CORRELATION ANALYSIS RESULTS OF THE MEASUREMENT VARIABLES

Variable	1	2	3	4	5	6	7
Human factor	-						
Physical factor	0.50*	-					
Organizational factor	0.41*	0.59*	-				
Financial performance	0.58*	0.51*	0.61*	-			
Customer performance	0.39*	0.56*	0.59*	0.53*	-		
Process performance	0.47*	0.49*	0.54*	0.65*	0.55*	-	
Education and learning performance	0.53*	0.33*	0.50*	0.38*	0.43*	0.54*	-

*p<0.05

The analysis results show that the human, physical, and organizational factors affecting a company's performance all have a positive correlation with financial performance, customer performance, process performance, and education and learning performance, all of which represent BSC management performance. As mentioned earlier, regression analysis was also conducted in this study, and the results are as follows. The regression model between the corporate factors and financial performance is shown in Table 3. With respect to the statistical significance of predicting financial performance, the analysis results show a 23.03 ($R^2 = 0.556$) F statistic, or 55.6% for the human, physical, and organizational factors. For the effects of the human factor on financial performance, $B = 0.38$ (non-standardization factor), $\beta = 0.34$ (standardization factor), and $p < 0.05$, showing that the human factor has a positive effect on financial performance. For the effects of the physical factor on financial performance, $B = 0.20$, $\beta = 0.21$, and $p < 0.05$, showing that the physical factor also has a positive effect on financial performance. As for the effects of the organizational factor on financial performance, $B = 0.23$, $\beta = 0.30$, and $p > 0.05$, showing that the organizational factor has no statistically

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significant impact on financial performance. The regression equation for the analysis results can thus be expressed as shown below.

$$Y_i = 5.11 + 0.38A_i + 0.2B_i + 0.23C_i + \varepsilon$$

Where,

Y_i: Financial performance
A_i: Human factor
B_i: Physical factor
C_i: Organizational factor

TABLE 3
REGRESSION MODEL BETWEEN THE CORPORATE FACTORS AND FINANCIAL PERFORMANCE

Independent variable	Dependent variable: Financial performance					
	Unstandardized coefficients		Standardized coefficients	*t*	*ρ*	*VIF*
	B	**Standard error**	***β***			
Constant	5.11	0.10	0.00	148.3	0.000	
Human factor	0.38	0.03	0.34	2.91	0.001**	1.71
Physical factor	0.20	0.08	0.21	3.59	0.183**	1.87
Organizational factor	0.23	0.07	0.30	2.32	0.007	1.71
R^2	0.556					
Adjusted R^2	0.476					
Durbin-Waston	1.891					
F	23.03 (ρ=0.000)					

*p<0.05, **p<0.01

The regression model between the corporate factors and customer performance is shown in Table 4. The analysis results show a 30.45 ($R^2 = 0.503$) F statistic with respect to the statistical significance of predicting customer performance, or 50.3% for the human, physical, and organizational factors. For the effects of the human factor on customer performance, $B = 0.21$, $\beta = 0.25$, and $p < 0.05$, showing that the human factor has a positive effect on customer performance. For the effects of the physical factor on customer performance, $B = 0.29$, $\beta = 0.16$, and $p < 0.05$, showing that the physical factor also has a positive effect on customer performance. For the effects of the organizational factor on customer performance, $B = 0.28$, $\beta = 0.03$, and $p < 0.05$, showing that the organizational factor likewise has a positive impact on customer performance. The regression equation for the analysis results can thus be expressed as shown below.

$$Y_i = 5.48 + 0.21A_i + 0.29B_i + 0.28C_i + \varepsilon$$

Where,

Y: Customer performance
A: Human factor
B: Physical factor
C: Organizational factor

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TABLE 4
REGRESSION MODEL BETWEEN THE CORPORATE FACTORS AND CUSTOMER PERFORMANCE

Independent variable	Dependent variable: Customer performance					
	Unstandardized coefficients		Standardized coefficients	*t*	*ρ*	*VIF*
	B	**Standard error**	***β***			
Constant	5.48	0.09	0.00	187.1	0.000	
Human factor	0.21	0.07	0.25	2.83	0.003*	1.71
Physical factor	0.29	0.04	0.16	4.12	0.005**	1.87
Organizational factor	0.28	0.03	0.14	1.76	0.004**	1.71
R^2	0.503					
Adjusted R^2	0.480					
Durbin-Waston	1.941					
F	30.45 (ρ=0.000)					

*p<0.05, **p<0.01

The regression model between the corporate factor and process performance is shown in Table 5. The analysis results show a 17.60 ($R^2 = 0.349$) F statistic with respect to the statistical significance of predicting process performance, or 34.9% for the human, physical, and organizational factors. For the effects of the human factor on process performance, $B = 0.17$, $\beta = 0.13$, and $p > 0.05$, showing that the human factor has no statistically significant impact on process performance. For the effects of the physical factor on process performance, $B = 0.21$, $\beta = 0.41$, and $p < 0.05$, showing that the physical factor has a positive effect on process performance. For the effects of the organizational factor on process performance, $B = 0.19$, $\beta = 0.10$, and $p > 0.05$, showing that the organizational factor has no statistically significant impact on process performance. The regression equation for the analysis results can thus be expressed as shown below.

$$Y_i = 5.14 + 0.17A_i + 0.21B_i + 0.19C_i + \varepsilon$$

Where,

Y_i: Process performance
A_i: Human factor
B_i: Physical factor
C_i: Organizational factor

TABLE 5
REGRESSION MODEL BETWEEN THE CORPORATE FACTORS AND PROCESS PERFORMANCE

Independent variable	Dependent variable: Process performance					
	Unstandardized coefficients		Standardized coefficients	*t*	*ρ*	*VIF*
	B	**Standard error**	***β***			
Constant	5.14	0.03	0.00	170.8	0.000	
Human factor	0.17	0.11	0.13	1.44	0.001	1.71
Physical factor	0.21	0.06	0.41	3.83	0.002**	1.87
Organizational factor	0.19	0.09	0.10	1.91	0.030	1.71
R^2	0.349					
Adjusted R^2	0.310					
Durbin-Waston	1.861					
F	17.60 (ρ=0.000)					

*p<0.05, **p<0.01

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The regression model between the corporate factors and education and learning performance is shown in Table 6. The analysis results show a 28.31 ($R^2 = 0.432$) F statistic with respect to the statistical significance of predicting education and learning performance, or 43.2% for the human, physical, and organizational factors. For the effects of the human factor on education and learning performance, $B = 0.14$, $\beta = 0.07$, and $p > 0.05$, showing that the human factor has no statistically significant impact on education and learning performance. For the effects of the physical factor on education and learning performance, $B = 0.23$, $\beta = 0.11$, and $p < 0.05$, showing that the physical factor has a positive effect on education and learning performance. For the effects of the organizational factor on education and learning performance, $B = 0.39$, $\beta = 0.34$, and $p < 0.05$, showing that the organizational factor has a positive impact on education and learning performance. The regression equation for the analysis results can thus be expressed as shown below.

$$Y_i = 5.82 + 0.14A_i + 0.23B_i + 0.39C_i + \varepsilon$$

Where,
Y_i: Education and learning preformation
A_i: Human factor
B_i: Physical factor
C_i: Organizational factor

TABLE 6
REGRESSION MODEL BETWEEN THE CORPORATE FACTORS AND EDUCATION AND LEARNING PERFORMANCE

Independent variable	Dependent variable: Process performance					
	Unstandardized coefficients		Standardized coefficients	*t*	*ρ*	*VIF*
	B	Standard error	*β*			
Constant	5.14	0.03	0.00	170.8	0.000	
Human factor	0.17	0.11	0.13	1.44	0.001	1.71
Physical factor	0.21	0.06	0.41	3.83	0.002**	1.87
Organizational factor	0.19	0.09	0.10	1.91	0.030	1.71
R^2	0.349					
Adjusted R^2	0.310					
Durbin-Waston	1.861					
F	17.60 (ρ=0.000)					

*p<0.05, **p<0.01

The following shows whether the analysis results obtained in this study support or do not support the study hypotheses about the effects of the independent variables on the dependent variables.

Hypothesis A: Financial performance in BSC management performance will have a positive effect on the factors affecting a company's performance
Hypothesis A-a: Financial performance will have a positive impact on the human factor (region of acceptance).
Hypothesis A-b: Financial performance will have a positive impact on the physical factor (region of acceptance)
Hypothesis A-c: Financial performance will have a positive impact on the organizational factor (region of rejection)

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Hypothesis B: Customer performance in BSC management performance will have a positive effect on the factors affecting a company's performance
Hypothesis B-a: Customer performance will have a positive impact on the human factor (region of acceptance)
Hypothesis B-b: Customer performance will have a positive impact on the physical factor (region of acceptance)
Hypothesis B-c: Customer performance will have a positive impact on the organizational factor (region of acceptance)

Hypothesis C: Process performance in BSC management performance will have a positive effect on the factors affecting a company's performance
Hypothesis C-a: Process performance will have a positive impact on the human factor (region of rejection)
Hypothesis C-b: Process performance will have a positive impact on the physical factor (region of acceptance)
Hypothesis C-c: Process performance will have a positive impact on the organizational factor (region of rejection)

Hypothesis D: Education and learning performance in BSC management performance will have a positive effect on the factors affecting a company's performance
Hypothesis D-a: Education and learning performance will have a positive impact on the human factor (region of rejection)
Hypothesis D-b: Education and learning performance will have a positive impact on the physical factor (region of acceptance)
Hypothesis D-c: Education and learning performance will have a positive impact on the organizational factor (region of acceptance)

RESEARCH IMPLICATIONS AND LIMITATIONS

The research policy implications of this paper are as follows. First, with regard to the usefulness of BSC, financial performance, customer performance, process performance, and education and learning performance were shown to influence companies' management performance on the human, physical, and organizational corporate factors, which differentiates this study from other similar studies. Second, the study demonstrated the usefulness of the relationship between BSC management performance and the factors affecting a company's performance (human, physical, and organizational factors). Specifically, this study was different from other similar studies in that it empirically analysed the effects of adjustments of the human, physical, and organizational factors affecting a company's performance. Third, the results of this study provide useful or practical information to the management practitioners of companies, such as data on companies' financial performance, customer performance, process performance, and education and learning performance that can be properly used by such companies' practitioners in formulating plans to provide information about how the company's BSC management performance will affect the human, physical, and organizational factors affecting the company's performance. To obtain results from the introduction of BSC, it is important for a company to increase the usefulness and activity of the system. A company that manages and makes good use of performance metrics, especially non-financial performance metrics, may attain a higher social status and financial performance than a company that does not. For effective BSC in terms of a company's management performance, the active participation of the company's chief executive officer (CEO), vision-strategy linkage, and development of effective indicators and meaningful criteria are essential. Although performance factors and metrics have a direct impact on management performance, it can be inferred that BSC usability and utilization levels will have a positive effect on management performance. Both theoretical and practical contributions are mandatory for publication in the journal. (Salamzadeh, 2020). It is believed that the results of this study will provide a systematic balance in and practical guidance on the use of the information obtained from BSC

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to achieve a company's performance objectives more efficiently by taking into account the major parameters' effects in the introduction and operation of the system.

This study had limitations, though, as follows. First, it is difficult to fully generalize the results of the study because it targeted only the public corporations in South Korea. The impacts of a company's financial, customer, process, and education and learning performances, as indicators, on the company's business performance may vary depending on the characteristics of and prevailing circumstances in each country. Identifying the relationship between such indicators and the business performance not only of the South Korean public enterprises but also of other types of enterprises and enterprises from other countries can help generalize the findings of this study and reduce the errors of generalization. Second, this study targeted only the public enterprises in South Korea in investigating the relationship between BSC management performance and the factors affecting a company's performance (human, physical, and organizational factors). It is necessary to study various kinds of enterprises to see the study results depending on the type of enterprise. Therefore, future research needs to be done to analyse the effects of various enterprises' financial, customer, process, and education and learning performances on their business performance.

CONCLUSIONS

In the current knowledge-information society, the development of a core information technology and of knowledge-based industries has led to changes in management consciousness. Most chief executive officers (CEOs) require innovative performance measures to manage the flow of management activities in their respective companies through a series of planning, implementation, and evaluation processes under the company's internal and external circumstances to implement discriminatory or cost-dominant strategic management. In a multi-competitive business environment, most companies that seek to gain a competitive edge are greatly influenced by the internal and external environmental factors, such as their internal performance, organizational improvement and innovation, customer management, and operational capabilities, as well as the stakeholder groups. For this reason, the company's CEO seeks to drive continued corporate growth through increased revenue and enhanced competitiveness by systematically managing the financial measurement indicators that appear as data from past management, and by strategically operating the outcomes that directly or indirectly affect the company's future financial performance. The results of the balanced scorecard (BSC) research are positive for both public and private enterprises, for which reason BSC has been introduced and is currently being implemented in various enterprises depending on the nature and type of enterprise. The BSC research results indicate that a causal relationship between BSC and management performance exists.

The purpose of this study was to study the usefulness of BSC and to present research implications. Towards this end, correlation and regression analyses were conducted among the study variables to determine how financial performance, customer performance, process performance, and education and learning performance under BSC performance affect the different factors affecting a company's performance (human, physical, and organizational factors), using the questionnaire collected from the public enterprises in South Korea. The analysis results are summarized as follows. First, a statistically significant positive correlation was found between BSC management performance (financial performance, customer performance, process performance, and educational and learning performance) and companies' human, physical, and organizational factors. Second, financial performance was found to have a positive impact on the human and physical factors, and the higher the human and physical factors were, the higher the financial performance. Third, under BSC management

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performance, customer performance was found to have a positive impact on the human, physical, and organizational factors, and the higher the higher the human, physical, and organizational factors were, the higher the customer performance. Fourth, process performance was found to have a positive effect only on the physical factor, and the higher the physical factor was, the higher the customer performance. Fifth, educational and learning performance was found to have a positive impact on the physical and organizational factors, and the higher the physical and organizational factors were, the higher the education and learning performance.

The differences in BSC's perception of the organization and its impact on management performance in accordance with role and responsibility (R&R) will be studied in the future research on BSC. Research will also be conducted to upgrade and operate the BSC performance management system based on the perception of acceptability.

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