

# FACTORS AFFECTING THE APPLICATION OF BALANCED SCORECARD (BSC) TO IMPROVE THE PERFORMANCE OF LISTED COMPANIES IN VIETNAM

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## ABSTRACT

*In this research, the authors focused on the meaning and impact of Balanced Scorecard (BSC) in the evaluation and improvement of performance of listed companies. The authors employed both qualitative and quantitative research methods to construct and evaluate the research model. Result of this research suggests that there are 7 factors affecting the application of BSC in listed companies in Vietnam; among those factors, Managers' awareness has the strongest impact, followed by Level of Competition, Business strategy, Characteristics of Management system, IT level, Staff skills, and Methods and Techniques applied. The research findings, on the other hand, demonstrate a positive relationship and the interaction between the elements that use the Balanced Scorecard approach to enhance the performance of listed companies in Vietnam.*

**Keywords:** Balanced Scorecard (BSC), Performance, Listed Companies

## INTRODUCTION

According to Atkinson, Kaplan, et al., (2012), listed companies are playing important roles in the development of the economies of both developing and developed countries. Aside from generating profits and value to contribute to the development of the organizations and Vietnam economy, those companies also create a myriad of job opportunities for locals. In order to maintain their growth rates, those listed companies need to make decisions that would affect their operations as well as social and economic benefits. According to Ulwick (2002), business related decision-making processes are critical, and the evaluation of organizational performance based on finance, customers, internal process, and learning & growth aspects using detailed standards and benchmarks would be necessary for the management of organizations. Balanced Scorecard is an effective tool for the establishment and evaluation of organizational performance. This tool would ensure that all aspects are considered in the decision making process, which would enable managers to make wise decisions to improve the performance of their companies.

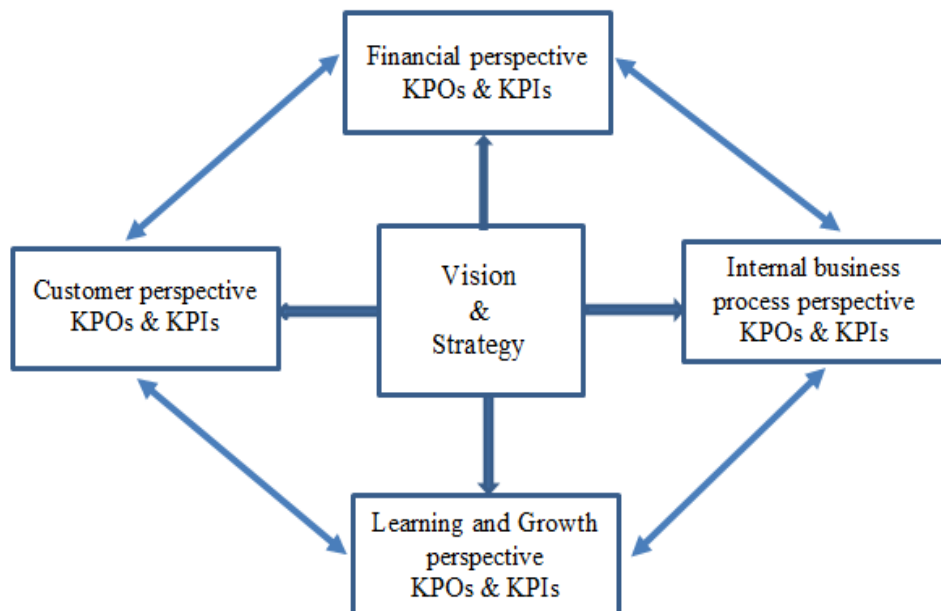
## Foundation Theories

### The Definition and Role of BSC in Corporations

By definition, BSC is a system for strategic plans development, utilized by both business and nonprofits organizations alongside governments to direct business activities based on the organizations' visions and plans, improve the efficiency of internal and external

communication and monitor business performance. It provides managers and official authorities with a clearer overview of the organization's operations (Kaplan & Norton, 1996).

BSC can transform the organizations' visions and plan into goals and specific measurements by establishing a system to evaluate the operations of the organization based on four main aspects which are finance, customers, internal business process, research and development. So, it can be understood that BSC is a managerial tool that helps organizations establish, execute, and monitor operations to achieve organizational targets by transforming strategic plans into specific targets and action plans.



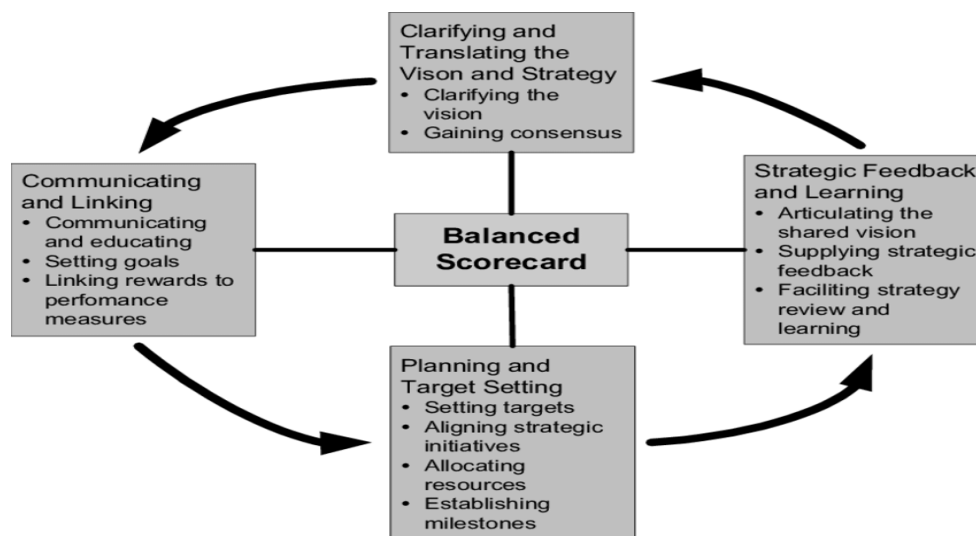
**FIGURE 1**  
**BSC PROVIDES A FRAMEWORK FOR TRANSFORMING STRATEGIC PLANS INTO PERFORMANCE CRITERIA**

(Source: Robert & David, 1996)

BSC provides a framework that helps transforming strategic plans into performance criteria. The balance is shown between short-term and long-term targets, financial and non-financial measurements, performance ratios and efficiency ratios, and between external and internal factors. BSC adds financial measurements of efficiency in the past and measurements of factors affecting efficiency in the future. Based on the organization's vision and strategic plans, researchers have been able to create targets and measurements for the scorecard system. These targets and measurements evaluate the organization's efficiency based on four perspectives: Finance, customer, internal business process, learning and growth. These four perspectives, or aspects, form BSC's framework

Furthermore, BSC is more than a strategic plan or activity measurement system. Many innovative companies are now currently using the scorecard system to manage their strategic plans to participate in harsh competitions (Fig 2). They have been able to utilize scorecard system to execute vital managerial processes such as:

- Clarify and translating and vision and strategy.
- Communicating and linking strategic targets and measurements.
- Planning and Target Setting.
- Strategic Feedback and Learning.



**FIGURE 2**  
**THE BALANCED SCORECARD AS A STRATEGIC FRAMEWORK FOR ACTION**

(Source: Kaplan & Norton (1992))

**Contents of a Balanced Scorecard System:** Shown in 4 perspectives:

**Financial perspectives:** According to Kaplan and Norton (1996), BSC focuses on the financial aspect because financial measurements are valuable in the evaluation of economic results arisen from operations. Based on analysis of financial operations of a company, managers can see if the implementation and execution of the strategy could actually improve their profits or not. A common financial benchmark is profitability, which is measured by revenues, usage of working capital or added values. Other financial benchmarks include growth rate of revenue or generation of cash.

**Customer perspectives:** According to Kaplan and Norton (1996), managers must identify target customers and market segments as well as indicators to measure operations in those segments. This aspect often includes typical measurements for the operation's success such as: customer satisfaction, customer loyalty, customer acquisition, and market shares in target market segments. This aspect also includes several specific targets related to the values that the company brings to its customers such as: shortening order time, delivering on time, continuous product improvement or the ability to forecast market demands and developing new products on time to fulfill those demands. Besides, customer aspect can help managers establish links between customers and the company's strategy, which will create financial value in the future.

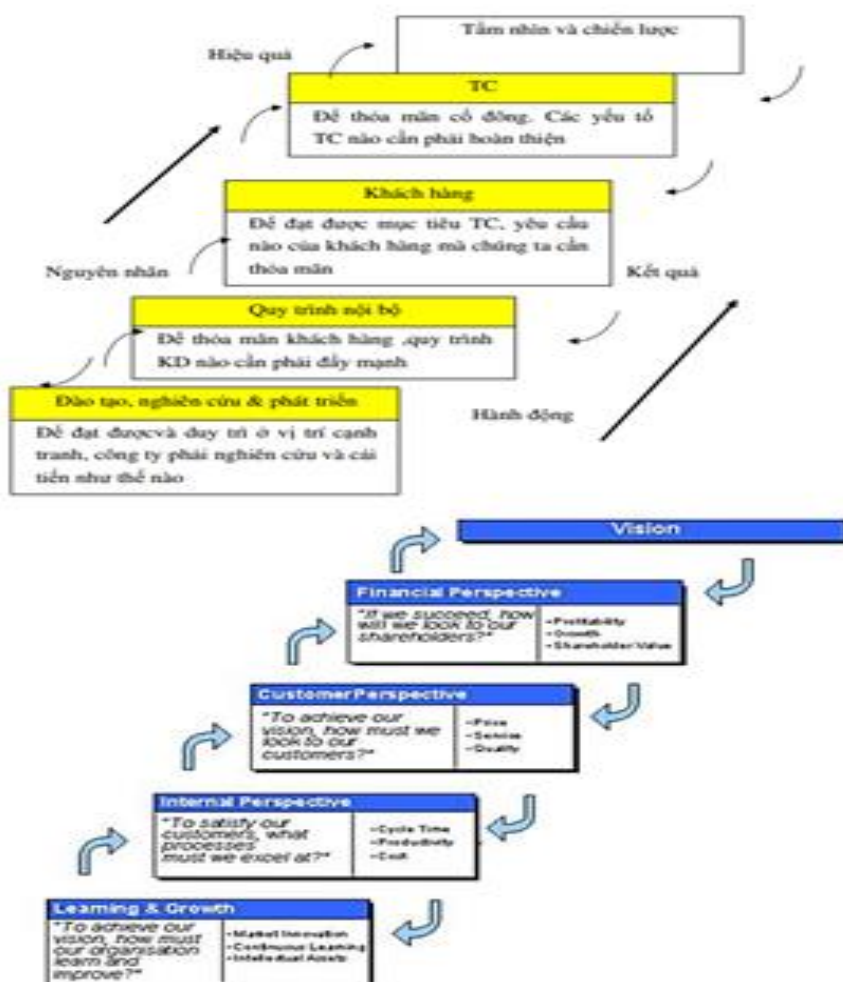
**Internal business process perspectives:** According to Kaplan and Norton (1996), managers must identify the organizations' core processes, which enable organizations to create value to attract or maintain customers in the target market and satisfy the shareholders' expectations. Besides, measurements in internal processes normally focus on processes that impact customer satisfaction and the organization's financial goals heavily, including: operating, relationship management, innovation, improvement and society-related processes.

**Learning and Growth perspectives:** According to Kaplan and Norton (1996), this aspect identifies the infrastructures that the organization must develop to enable long-term development and innovation. Furthermore, the organization's training sessions and development projects can be implemented using three primary resources: human resources, information resources and organizational resources. Besides, financial, customer and internal processes targets highlight the large gap between current human resources capacity,

information, organizing ability and the requirements needed to create a significant breakthrough for the organization in the future. In order to eliminate this gap, organizations need to improve their employee's abilities, strengthen their IT systems and carry out restructuring. These targets are included in BSC's research and development aspect alongside measurements related to the employees such as the satisfaction, training and skills of employees. Additionally, the IT system's capabilities can be calculated through the availability and accuracy of customer information and internal processes information.

### Meaning of BSC

According to Atkinson, et al., (2012), recent researches have suggested that BSC is not just an improved measurement system. Some organizations have been using BSC as their core management systems. Apparently, many organizations have transformed their missions and strategic plans into measurements that can emphasize the urge to establish new relationship with customers and the và sự vượt trội trong một số lượng các quy trình nội bộ rộng lớn hơn. BSC directs the whole organization towards innovations, unifies various departments within the organization, etc. Besides, BSC also helps division directors, managers, and employees realize their roles and importance in the implementations of the organization's plans. However, it is quite difficult to apply BSC since it would require lots of time and resources.



**FIGURE 3**  
**RELATIONSHIP BETWEEN BSC'S ASPECTS**

(Source: Atkinson, Kaplan et al., (2012))

BSC does not only set priorities for organizations to focus on important processes, it can also identify new processes that need to be established for organizations to achieve breakthrough targets. Additionally, BSC provides measurements - such as the shortening of order cycle and the reduction of the time to approach the market - for the evaluation of the benefits of plans to transform and restructure the organization. Because of these measurements, transformation plans are not simply cost-reduction plans any longer. Lastly, BSC combines the process of preparing strategic plans and budget plans, which are two processes that were previously separated and incompatible. With this unification process, the process of creating long-term strategic plans will be performed alongside the process of creating annual budget plans. The result of this is a list of measurements and targets that the organization must follow to achieve long-term plans.

### Performance of Organizations

According to Otley (1999), the performance of the organization is shown in different aspects including: targets, strategies, performance indicators, reward systems and IT systems. Organizations' performance also helps managers maintain and improve the standards in the organization. According to Kaplan & Norton (1992), Organization Performance Structure was developed to measure the organization's overall performance. Additionally, the organization's performance could also be measured using financial and non-financial criteria. Financial criteria include total profit, market share, ROA, ROI, etc. Non-financial criteria include customer satisfaction, quality of products, service, development and training

<b>Ratios</b>	<b>Measurements</b>
Market shares	Customer rate, Revenues, Volume of sales in compared with industrial average.
Return - On - Assets (ROA)	$ROA = \text{Net Income (Profit after tax)} / \text{Total Assets}$
Return - On - Investment (ROI)	$ROI = \text{Investment Gain} / \text{Investment Base}$
Marginal Revenue (Chenhall, 2007)	Change in total revenue / Change in quantity sold
Total Profit	$\text{Total Profit} = \text{Total Revenue} - \text{Total expenses}$
Other resources	Tỷ lệ gia tăng nguồn lực
Acquired customers	- Amount of new Customers - Revenues generated from new Customers - Revenues generated from new customers divided by total revenue
Retained customers	- Percentage of revenue generated by current customer base over total revenue. - Loyal customer rate: % of growth rate associated with current customer base.
Profit generated by customers	- Quarterly changes in profits generated by customers - Tỷ lệ khách hàng mang lại lỗ so với khách hàng mang lại lãi

(Source: Kaplan & Norton, 1992)

<b>Ratios</b>	<b>Benchmarks</b>
Attitudes and Ethics of staffs	- Chỉ số tuân thủ mệnh lệnh cấp trên - Chỉ số chủ động trong công việc - Honesty and Integrity - Cooperation between colleagues - Learning & Growth - Motivation
Customer satisfaction	- Number of successful transactions - Number of returns and refunds.

	<ul style="list-style-type: none"> <li>- Number of customer satisfaction regarding designs and quality of product.</li> <li>- Number of complaints about quality of product.</li> </ul>
Product and service quality	<ul style="list-style-type: none"> <li>-Product Quality: based on its standards and benchmarks.</li> <li>-Time: Reflected by quality of product and delivery time.</li> <li>-Satisfy customers' requirements.</li> <li>-Price: Reflected by production cost and cost to utilize the product.</li> </ul>

(Source: Kaplan & Norton, 1992)

### **BSC's Role in the Improvement of Performance**

According to Kaplan and Norton (1996), successful implementation of BSC would provide managers with a better overview of the organization's performance compared to the resources available. Based on such information, managers could create solutions to optimize the resources usage to improve the organization's performance. This will be shown in details below:

BSC is a measurement system: Even though financial measurements can visualize past events, they are not suitable for emphasizing the value creation process of organizations. These are intangible assets such as knowledge, information, network, etc. Those financial measurements are referred to as "lagging indicators", which show results of a series of past actions. Furthermore, BSC supplements those "lagging indicators" with "leading indicators" that would help managers with strategic decisions that would create economic benefits in the future. However, those measurements, including both "lagging indicators" and "leading indicators", all originated from the organization's strategy. Additionally, BSC could be seen as a tool to clarify organizational strategies and targets.

BSC is a strategic management system: Initially, BSC was a system consisting of measurements used for balancing and clarifying financial indicators which can measure the efficiency of the organization and its strategy. However, as time goes on, more organizations use BSC as a tool to link short-term campaigns with the organization's strategies. To achieve this, BSC replaced many theoretical aspects with measurements and implementation of the strategy. Moreover, BSC helps overcoming the obstacle of guiding people towards the common goal by explaining the strategy in details: BSC aims to share knowledge and transform the organization's strategy into specific criteria, measurements and indicators. When using BSC as the foundation to explain the strategy, organizations create a new measurement method to guide people towards achieving the strategy.

BSC is a communication tool used for overcoming HR barriers: For the strategy to be successfully achieved, it must be implemented and understood at all levels of the organization. Furthermore, to create the opportunity for workers to connect their daily works with the organization's strategies, BSC must be implemented in every department of the organization. Additionally, all departments of the organization should also recognize their roles, positions and value-added activities through the connection between their responsibilities and the organization's targets. Moreover, BSC provides responses from staffs to BOM, which allows the constant update of the status of the strategy's implementation.

BSC provides solutions to overcome resources related barriers: Resources are critical for the development of organizations. Most of the organizations are executing their strategies without sufficient resources. So how should resources be divided and allocated? It could be seen that without BSC, most organizations are planning their strategies and budgets separately. However, with BSC, organizations can combine the two processes; aside from setting targets, benchmarks, indicators of 4 aspects, BSC also takes into account ideas and action plans to help the organizations achieve their targets.

BSC is an information exchange tool: Exchange of information happens between managers and employees. In recent years, there have been several documents related to the knowledge management strategy in organizations. The common characteristic of those

strategies is how they want the employee's hidden knowledge to be exposed and shared. Employees, unlike organizations that depend on their tangible assets, rely on their knowledge. Nowadays, operations must face the challenge of systemizing and control that knowledge.

## RESEARCH METHODS, MODELS AND HYPOTHESES

### Research Data and Methods

By using non-probability sampling method, authors were able to collect information from 550 companies listed on HOSE and HNX; among 518 survey forms, only 496 forms were valid for the analysis (22 forms were invalid due to missing information or unsuitable answers for the authors' requirements). Respondents are board of directors' representatives in charge of the organization's accounting and finance. Due to several reasons and conditions, the authors couldn't collect information from more organizations. The authors employed Google documents to collect information from 10/2019 to 1/2020 in primary fields such as consumer goods industry; food and catering industry; High-tech industry; Medical industry, etc.

The main method of research used for this research is Structural Equation Method (SEM) with the help of 2 main softwares, AMOS – SPSS. According to Geogre Tauchen (1986), to achieve a reliable estimation for this method, the sample size must be greater than 200. With 15-44 observations for a variable, the minimum sample size needed for this research would be  $280 = 35 \times 8$ , or  $n > 50 + 8 \times \text{variables} = 50 + 8 \times 8 = 114$  (Hair et. al., 2010). By combining these rules, the minimum sample size that the authors chose was  $n > 280$ . Therefore, with 496 samples collected, the minimum sample size requirement of 280 samples has been surpassed.

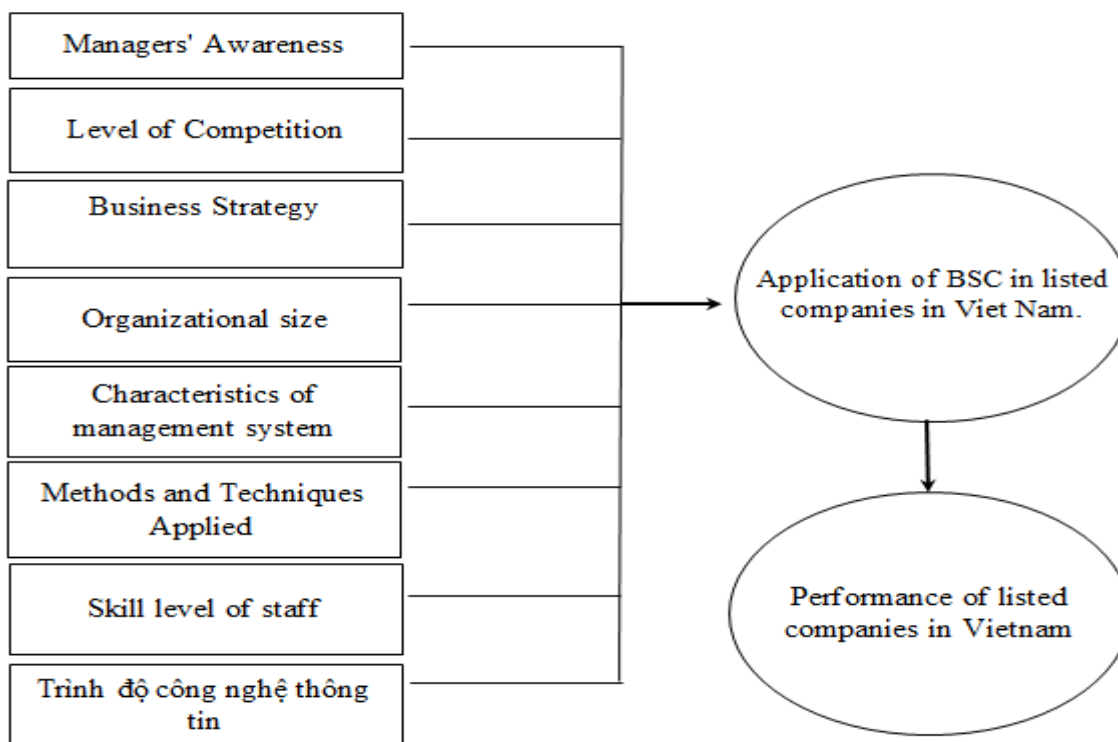
### Research Models and Hypotheses

Contingency Theory was developed and utilized by management accounting researchers from the 1970s to the 1980s. Contingency Theory researchs management accounting, in general, and BSC, in specific, in organizations based on the relationship between the organizations and surrounding environments. In another way, how an accounting system fits the organization depends on the organization's characteristics and the specific working environment. This means that building an efficient BSC system requires the compatibility with each organization, as well as its internal and external environment. Furthermore, Contingency theory shows how characteristics and environmental factors impact the usage of information that was provided by BSC. Gordon & Miller's research results (1976) was applied to the research, by which contingency theory will be utilized to explain the effects of factors such as: Level of competition, Business strategy, Organizational size, the organization's management system, and IT level to the application of BSC in the organization.

According to Nick & Clive (1993) Cost-benefit analysis (CBA) started in 1808 when Albert Gallatin mentioned it in an irrigation project while comparing the costs and benefits of the project. In 1936, CBA was officially mentioned in a flood control regulation in the US, in which costs and benefits must be considered before proceeding with the project. CBA then get researched and expanded on for Welfare Economics by Eckstein (1958). CBA points out that benefits gained from the supply of information must be compared against the costs of creating and supplying that information. In general, benefits of accounting information can be used by: relevant parties, investors and organizations; while the costs are beared by accounting information reporters and more generally, society. Therefore, there must be frequent inspections and balancing to make sure the costs do not exceed the benefits. The

goal of management accounting is to satisfy the organization's management needs, therefore, each organizations have different requirements for their management accounting information system and different ways of using their management accounting technical tools. The theory helps explaining the factor of the managers' awareness; the performed methods and techniques; the employees' proficiency as well as the IT level of the organization when using management accounting as well as BSC for the organization.

Based on past experiments and foundation theories, the authors built a research model and hypotheses as below:



**FIGURE 4**  
**RESEARCH MODEL**

To consider the influence level and importance of factors that affect BSC's usage in listed companies in Việt Nam, several hypotheses were constructed:

- H1: The factor of Manager's awareness has direct relationship (+) with the application of BSC to heighten performance of listed companies in Vietnam.*
- H2: The factor of Level of Competition has direct relationship (+) with the application of BSC to heighten performance of listed companies in Vietnam.*
- H3: The factor of Business strategy has direct relationship (+) with the application of BSC to heighten performance of listed companies in Vietnam.*
- H4: The factor of Organizational size has direct relationship (+) with the application of BSC to heighten performance of listed companies in Vietnam.*
- H5: The factor of Characteristics of management system has direct relationship (+) with the application of BSC to heighten performance of listed companies in Vietnam.*
- H6: The factor of Methods and techniques applied has direct relationship (+) with the application of BSC to heighten performance of listed companies in Vietnam.*
- H7: The factor of Skill level of Staff has direct relationship (+) with the application of BSC to heighten performance of listed companies in Vietnam.*
- H8: The factor of IT level has direct relationship (+) with the application of BSC to heighten performance of listed companies in Vietnam.*
- H9: The Application of BSC has direct relationship (+) with the increase of performance of listed companies in Vietnam.*



## Regression Analysis

The authors built a multivariable regression model to test hypotheses

Theoretically, Regression Analysis is expected to reflect the relationship between factors that affects the application of BSC to improve the performance of listed companies in Vietnam.

$$VD = \beta_0 + \beta_1 NT + \beta_2 CT + \beta_3 CL + \beta_4 QM + \beta_5 BM + \beta_6 PK + \beta_7 TD + \beta_8 CN + \delta$$

In which:

$\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7$ : regression functions

$\delta$ : Variance

Dependent Variable e.g: Application of BSC.

### Independent variables

NT: Managers' awareness;

CT: Level of competition;

CL: Business strategy;

QM: Organizational size;

BM: Characteristics of management system;

PK: Methods and Techniques applied;

TD: Skill level of staff;

CN: IT level.

## RESEARCH RESULTS

### Evaluate Scales of Measurement

By appying Cronbach's Alpha to test for reliability, it could be observed that 43/43 observed variables of 10 factors in the research model are qualified. Since minimum corrected item-total correlation of each factor is greater than 3.0 while Cronbach's Alpha is greater than 0.7, all measurements are valid and have good reliability.

Table 3 summarizes the result of analysis of reliability in the model.

STT	Measurements	Amount of initial observed variables	Amount of observed variables after tested	Cronbach's Alpha	Minimum Corrected Item - Total correlation
1	Managers' awareness (NT)	5	5	0.908	0.677
2	Competitive level (CT)	5	5	0.878	0.665
3	Business strategy (CL)	6	6	0.881	0.644
4	Organizational Size (QM)	3	3	0.805	0.630
5	Charateristics of management system (BM)	3	3	0.813	0.641
6	Methods and Techniques applied (PK)	4	4	0.899	0.899
7	Staff Skill (TD)	5	5	0.865	0.612
8	IT level (CN)	4	4	0.815	0.613
9	Application of BSC in listed companies in Vietnam (VD)	4	4	0.830	0.611
10	Perfomance of listed companies in Vietnam (TQ)	4	4	0.820	0.610

(Source: Authors constructed from analysis conducted using SPSS)

## Exploratory Factor Analysis

The authors carried out Exploratory Factor Analysis (EFA) using Principal Component Analysis as the Extraction method with Varimax Rotation and end points with Eigenvalue  $>1$ . Results of EFA showed that  $KMO = 0.906$ ; meanwhile, Bartlett's test ended up with  $Sig. = 0.000$  ( $<0.05$ ). Therefore, EFA is considered to be appropriate.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.906
Bartlett's Test of Sphericity	Approx. Chi-Square	12552.390
	Df	990
	Sig.	0.000

(Source: Authors constructed from analysis conducted using SPSS)

At Eigenvalue  $=1.416 > 1$  extracted from 10 factors in 43 observations with total average variance extracted of 69.452% ( $>50\%$ ) and no new factor was discovered. Therefore, after EFA, those 43 observed variables were qualified and no factor was eliminated.

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings <sup>a</sup>
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	11.365	25.255	25.255	10.988	24.418	24.418	7.117
2	3.716	8.258	33.513	3.325	7.388	31.806	5.462
3	2.636	5.859	39.372	2.253	5.008	36.814	5.899
4	2.548	5.662	45.034	2.172	4.827	41.640	4.853
5	2.364	5.252	50.286	1.973	4.385	46.025	5.052
6	2.174	4.832	55.118	1.834	4.075	50.100	6.308
7	1.925	4.277	59.395	1.527	3.394	53.494	7.609
8	1.599	3.553	62.948	1.232	2.739	56.233	3.450
9	1.511	3.358	66.306	1.139	2.531	58.764	3.647
10	1.416	3.147	69.452	1.002	2.226	60.990	3.863
11	0.742	1.648	71.101				

(Source: Authors constructed from analysis conducted using SPSS)

By applying EFA, the authors analyzed each variable to test for multidimensionality and evaluate its measurements.

STT	Measurement	KMO	Eigenvalues	Average Variance Extracted	Notes
1	Managers' awareness (NT)	0.896	3.668	66.931	Accepted
2	Competitive level (CT)	0.880	3.365	59.219	Accepted
3	Business strategy (CL)	0.905	3.803	56.122	Accepted
4	Organizational size (QM)	0.702	2.166	58.804	Accepted

5	Characteristics of management system (BM)	0.713	2.194	59.869	Accepted
6	Methods and techniques applied (PK)	0.833	3.069	69.292	Accepted
7	Staff skill (TD)	0.859	3.276	57.264	Accepted
8	IT level (CN)	0.798	2.573	52.486	Accepted
9	Application of BSC in listed companies in Vietnam (VD)	0.800	2.652	55.309	Accepted
10	Performance of listed companies in Vietnam (TQ)	0.801	2.605	53.584	Accepted

(Source: Authors constructed from analysis conducted using SPSS)

### Confirmatory Factor Analysis (CFA)

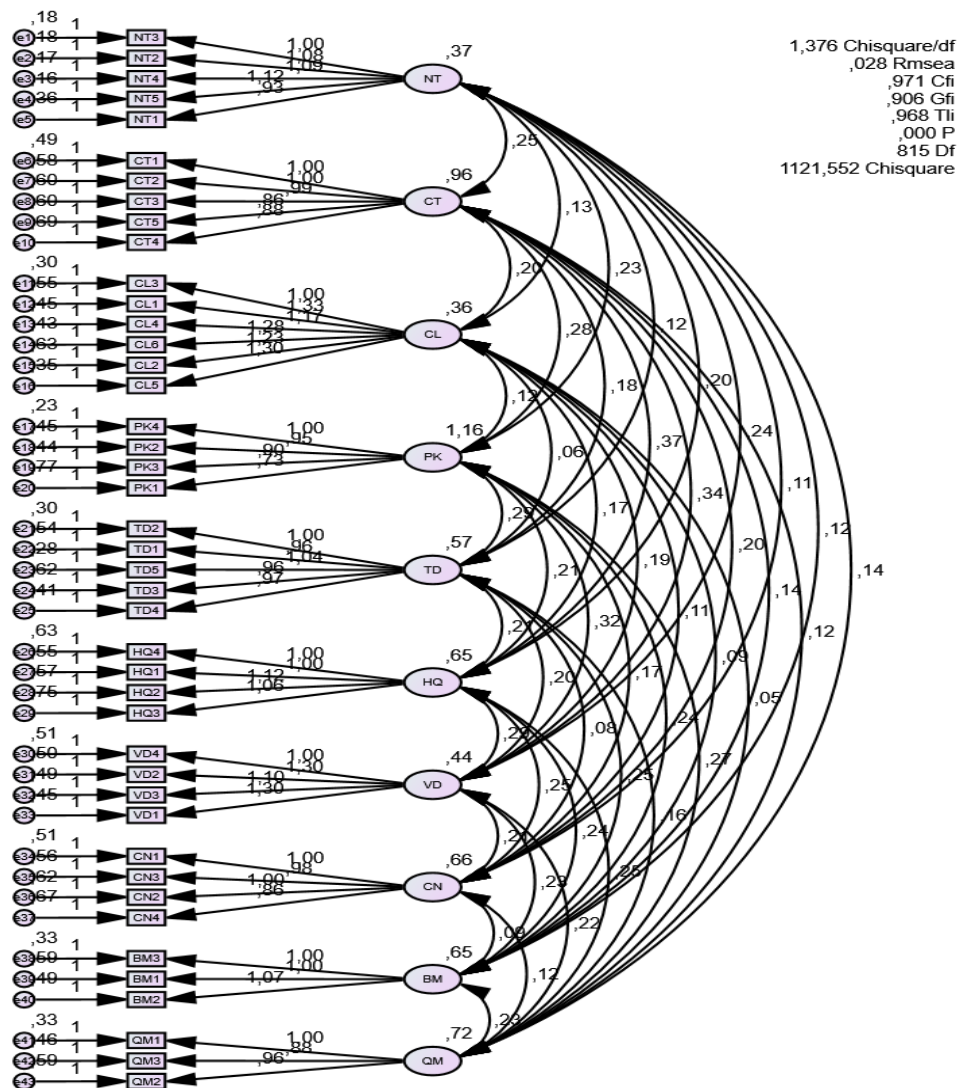
			Estimate
NT3	<---	NT	0.817
NT2	<---	NT	0.839
NT4	<---	NT	0.852
NT5	<---	NT	0.863
NT1	<---	NT	0.684
CT1	<---	CT	0.813
CT2	<---	CT	0.791
CT3	<---	CT	0.781
CT5	<---	CT	0.739
CT4	<---	CT	0.721
CL3	<---	CL	0.738
CL1	<---	CL	0.733
CL4	<---	CL	0.724
CL6	<---	CL	0.762
CL2	<---	CL	0.683
CL5	<---	CL	0.799
PK4	<---	PK	0.913
PK2	<---	PK	0.837
PK3	<---	PK	0.827
PK1	<---	PK	0.670
TD2	<---	TD	0.811
TD1	<---	TD	0.703
TD5	<---	TD	0.831
TD3	<---	TD	0.678
TD4	<---	TD	0.752
HQ4	<---	HQ	0.713
HQ1	<---	HQ	0.739
HQ2	<---	HQ	0.768
HQ3	<---	HQ	0.703
VD4	<---	VD	0.680
VD2	<---	VD	.775
VD3	<---	VD	.724
VD1	<---	VD	.790
CN1	<---	CN	.750
CN3	<---	CN	.727
CN2	<---	CN	.715

CN4	<---	CN	,648
BM3	<---	BM	,816
BM1	<---	BM	,724
BM2	<---	BM	,778
QM1	<---	QM	,830
QM3	<---	QM	,739
QM2	<---	QM	,728

(Source: Authors constructed from analysis conducted using SPSS)

As it can be seen in Table 4.5, all Standardized Regression Weights are greater than 0.5, which means that all variables have convergent validity and P-value has statistical meaning.

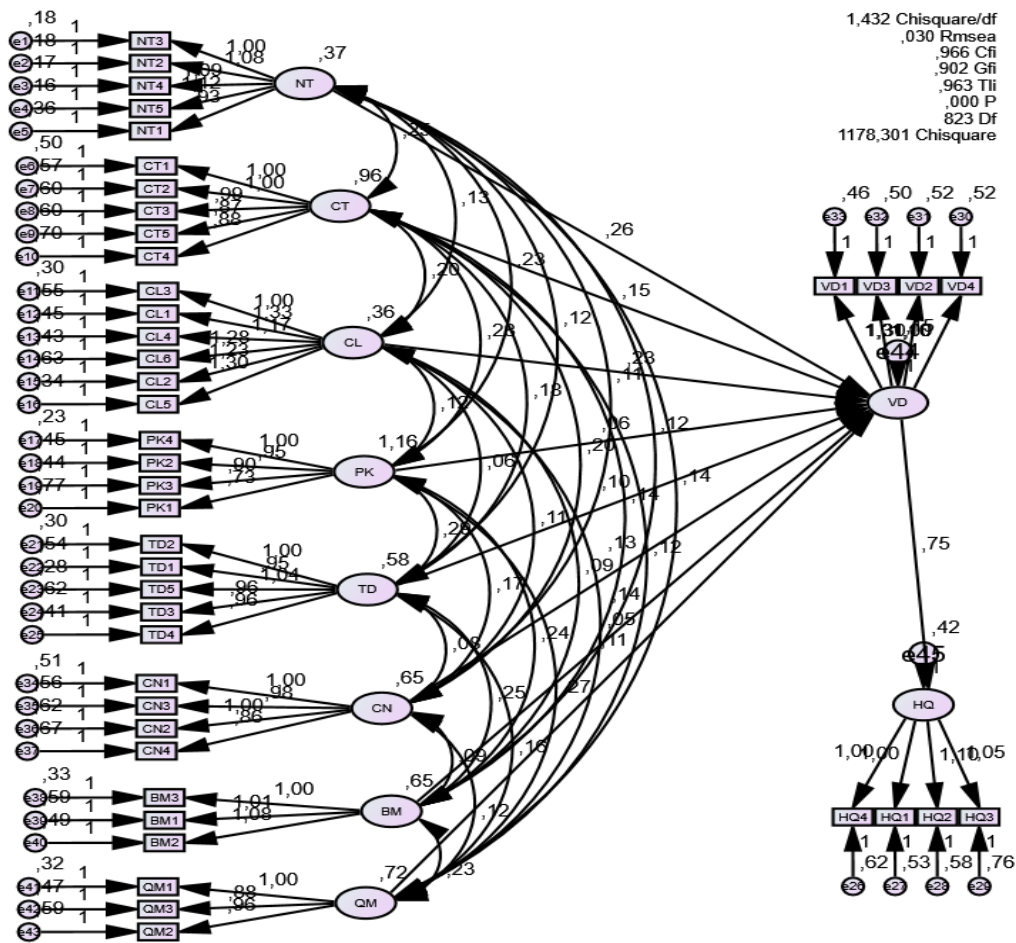
Result shows that the research model is appropriate with data, since Chi-squared = 1121.552; Degree of Independence = 815; CMIN/df = 1.376 < 2; P value = 0.000. Other measurements also meet the necessary requirements: CFI = 0.971 > 0.9; GFI = 0.906 > 0.9; TLI = 0.968 > 0.9; RMSEA = 0.028 < 0.05. All weights of variables are greater than 0.5, and P value = 0.000 so there is statistical meaning.



**FIGURE 5**  
**RESULTS OF CFA**

Testing the Theoretical and Hypotheses Structure using Structural Equation Modeling

Testing Theoretical Structure



**FIGURE 6**  
**RESULTS FROM TESTING THEORETICAL STRUCTURE USING SEM**

Result shows that the research model is appropriate with data, since Chi-squared = 1178.301; Degree of Independence = 823; CMIN/df = 1.432 < 2; P value = 0.000. Other measurements also meet the necessary requirements: TLI = 0.963; CFI = 0.966; GFI = 0.902 > 0.9; RMSEA = 0.030 < 0.05. All weights of variables are greater than 0.5, and P value = 0.000 so there is statistical meaning. This suggests that the research model is appropriate with data. Result also showed that all variables had direct positive impact on the application of BSC to improve the performance of listed companies in Vietnam.

			Estimate	S.E.	C.R.	P
Application of BSC in listed companies in Vietnam	<---	Managers' awareness	0.259	0.050	5.142	***
	<---	Level of Competition	0.152	0.030	5.062	***
	<---	Business strategy	0.231	0.047	4.894	***
	<---	Methods and Techniques applied	0.063	0.025	2.478	0.013
	<---	Staff skills	0.095	0.038	2.532	0.011
	<---	IT level	0.129	0.034	3.785	***

	<---	Characteristics of Management system	0.145	0.038	3.847	***
	<---	Organizational size	0.106	0.034	3.172	0.002

As can be seen in the table, all hypotheses in the research model were confirmed by SEM. Estimations of all weighted values were positive and had statistical meaning, which suggested that all factors in the research model, including Managers' awareness, Level of Competition, Business strategy, Methods and Techniques applied, Staff skills, IT level, Characteristics of Management system, and Organizational size had direct impact on the application of BSC to improve the performance of listed companies in Vietnam.

### Bootstrap Test

Bootstrap test is used to test the variables that were measured using Maximum Likelihood)

**Table 8**  
**RESULT OF BOOTSTRAP TEST WITH N = 1000**

Parameter		SE	SE-SE	Mean	Bias	SE-Bias	C.R	
Application of BSC in listed companies in Vietnam	<---	Managers' awareness	0.042	0.001	0.238	-0.001	0.001	1
	<---	Level of Competition	0.043	0.001	0.228	0.001	0.001	1
	<---	Business strategy	0.040	0.001	0.213	0.001	0.001	1
	<---	Methods and Techniques applied	0.043	0.001	0.105	0.002	0.001	2
	<---	Staff skills	0.044	0.001	0.108	-0.002	0.001	2
	<---	IT level	0.042	0.001	0.159	0.000	0.001	0
	<---	Characteristics of Management system	0.043	0.001	0.178	0.001	0.001	1
		Organizational size	0.043	0.001	0.139	0.001	0.001	1

Bootstrap test was carried out using repeated samples with size N = 1000. Because the value of CR was less than 3, it was confirmed that deviation was extremely small and had no statistical meaning at reliability level of 95%, which suggested that all estimations in the research model were reliable and valid.

### Testing Hypotheses

**Table 9**  
**STANDARDIZED REGRESSION WEIGHTS OF THE RESEARCH MODEL**

Hypothesis	Correlation		Estimate	S.E.	C.R.	P	
H1	Application of BSC in listed companies in Vietnam	<---	Managers' awareness	0.239	0.050	5.142	***
H2		<---	Level of Competition	0.227	0.030	5.062	***
H3		<---	Business strategy	0.212	0.047	4.894	***
H4		<---	Methods and Techniques applied	0.104	0.025	2.478	.013
H5		<---	Staff skills	0.110	0.038	2.532	.011
H6		<---	IT level	0.159	0.034	3.785	***
H7		<---	Characteristics of Management system	0.177	0.038	3.847	***
H8		<---	Organizational size	0.138	0.034	3.172	.002
Performance of listed companies in Vietnam	<---	Application of BSC in listed companies in Vietnam	0.606	0.076	9.843	***	

As can be seen in the table, all factors have direct relationship with the application of BSC in listed companies in Vietnam, in which Managers' Awareness has the strongest impact (standardized weight =0.239), Level of Competition has the second strongest impact (standardized weight =0.227). This is followed by Business strategy (standardized weight = 0.212), Characteristics of management system (standardized weight =0.177), IT level (standardized weight =0.159), Staff skills (standardized weight =0.110). The factor with the lowest degree of impact is Methods and Techniques (standardized weight =0.104).

There is a tight relationship between the application of BSC and the improvement of performance of listed companies in Vietnam. Research results confirm this hypothesis with standardized beta =0.606 at  $P = 0.000 < 0.05$ , which emphasizes the positive interaction and impact of factors affecting the application of BSC to improve the performance of listed companies in Vietnam. Without taking into account other factors, if the application of BSC increases (or decreases) by 1 point (level), it would lead to an increase (or decrease) of 0.606 in the performance of listed companies in Vietnam

## CONCLUSION AND RECOMMENDATIONS

### Conclusion

Results from theoretical and hypotheses structures which were achieved using structural equation modeling (SEM) show that all hypotheses H1, H2, H3, H4, H5, H6, H7, H8, H9 affect how BSC improves efficiency in listed companies in Vietnam, in which Manager's awareness; Level of Competition; Business strategy; Organizational size, Characteristics of management system; Methods and techniques applied, Skills level of staff and IT level have direct positive relationship with the improvement of efficiency in listed companies in Vietnam.

### Recommendations

Through the results from testing the structure, according to the authors, to improve the efficiency in listed companies in Vietnam, managers must take notice of several matters.

Firstly, managers must see BSC as a tool for 1 main strategy. Apparently, the process of carrying out BSC started from conducting general analysis and evaluate the state of the organization, from vision, mission, customer expectations, core value (or competitive advantages), strategy, system, process, HR and culture. On the basis of overall analysis, companies have to choose 3-4 strategies to achieve their targets and goals. Those strategies must utilize or improve the company's core value (or competitive advantages). For each selected strategy, companies must then identify their goals based on 4 aspects of BSC: Financial, Customers, Internal Process and Learning & Growth. Goals must be closely linked with each other, using Cause-Effect Relationship, to form an overall strategy. Additionally, to achieve the goals and targets, the company must construct a list of core solutions. Since BSC is a tool for constructing, applying and managing strategies, the process of reviewing the efficiency and rationality of the criteria as well as the application of core projects must be carried out frequently to make necessary adjustments.

Secondly, managers must be aware of the importance and usefulness of applying BSC to measure the performance and efficiency of the organization on the scale of organizational efficiency; departmental efficiency as well as individual efficiency. Managers should have plans to implement BSC in their departments with acceptable and reasonable costs. Additionally, in order to ensure successful implementations of BSC, managers must train and improve their employees' skills for them to understand and know how to utilize technologies in the application of BSC.

However, there are some limitations, in which the research only focuses on the impact of internal factors on the implementation of BSC and neglects the impact of external factors. Besides, since the scope of research only extends to listed companies in Vietnam, sample size is deemed to be insufficient to represent all listed companies in Vietnam.

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