

**GLOBAL JOURNAL OF ADVANCED ENGINEERING TECHNOLOGIES AND SCIENCES****SEM MODEL FOR FIRM PERFORMANCE OF VIETNAMESE BANKS BASE ON BALANCED SCORECARD****Kim-Phung Truong<sup>1,2,\*</sup>, Ming-Hung Shu<sup>1</sup>, Bi-Min Hsu<sup>3</sup>, Thanh-Lam Nguyen<sup>4</sup>**<sup>\*</sup><sup>1</sup>Department of Industrial Engineering and Management, National Kaohsiung University of Applied Sciences, Taiwan<sup>2</sup>Department of Financial and accounting, Lac Hong University, Dong Nai, Vietnam<sup>3</sup>Department of Industrial Engineering and Management, Cheng Shiu University, Taiwan<sup>4</sup>Office of Scientific Research, Lac Hong University, Bien Hoa, Dong Nai, Vietnam

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**ABSTRACT**

In the global financial crisis conditions, Vietnam banking sector has suffered from liquidity and deadlock in the operation. Indispensably, evaluation and measurement of performance are an important task for the banks as well as has become a pressing, but many managers agree that their evaluation systems do not adequately fulfill this function. Actually, balanced scorecard (BSC) is a new idea in performance management and applies to evaluate firm or bank performance through finance and non-financial dimensions. The purpose of this study is to determine the factors of BSC actually affecting Vietnamese banks. Besides, to test and generate model which is the best fit model used for the application and implementation BSC. Another purpose of study is to contribute to the understanding of how BSC is developed and applied in evaluating the performance of banks in Vietnam. Based on the concepts of Kaplan and Norton, using the data declare available from the banks, stock market for the financial dimension and survey for non-financial dimension. BSC is derived to evaluating and measuring the performance of the banks in 2015. In the indefectible combination, Structural Equation Modeling (SEM) is employed to test relationships of BSC and firm performance of Vietnamese banks and adopted to verify the goodness of fit effects of measurement model and structural model. The results also indicate that BSC directly and positively influence firm performance of Vietnamese banks. Furthermore, due to lack of research work in this area and the banking sector in Vietnam, this study contributes to the knowledge on how Vietnamese banks may apply the BSC to evaluate their performance and management system. The author proposes some future research needs required in this area. The study also proposes the conceptual framework of the relationship between BSC and the firm performance of Vietnamese banks to direct corporate performance at strategic vision of future research.

**KEYWORDS:** balanced scorecard, firm performance, performance evaluation, bank, structural equation modeling.

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**INTRODUCTION**

In 2015, the panorama of the world economy with the basic characteristics includes slow growth, unbalanced and always unstable. The economy of Vietnam cannot avoid the low growth status and the high inflation. In this context, Vietnam's banking sector is experienced a difficult year. At the beginning of 2015, the implementation of resolution eleven focuses solutions to curb inflation, to stabilize the macroeconomic and to ensure social security, the State Bank of Vietnam is administered the monetary policy with a focus target is to restrain the inflation. Some outstanding results are achieved such as: first, the credit increases and the total payments achieve the set targets, and the administrative measures such as the cap deposit rate has solved some unrest in the macroeconomic. Second, the credit line is initially orientated better in the area of rural agricultural production, medium and small businesses as well as the production of export goods, the foreign exchange market, and operating rate policy has many positive changes. Third, controlling the operations of the commercial banks is improved and enhanced discipline of bank's the financing market. However, in addition to aforementioned early success, there are still some inherent shortcomings of the operation in the banking sector in Vietnam. The main shortcomings of the operation in the Commercial Bank Vietnam include: growth rate of total assets and credit are slowed and no associate with improving credit quality; the banking system has a difficult thing in raising capital and liquidity which became the deeply concern; the profitability of the commercial banking system is low; and the safety monitoring system of the State Bank also has the shortcomings.

**Macroeconomic approach**

The excessively credit expansion reduces the marginal benefit of credit to the Vietnam economy. Since 2007, the credit expansion rate of Vietnam is rapidly increased compared with the gross domestic product (GDP) growth rate. Comparing with other countries in the region, GDP per credit rate of Vietnam has the strong fluctuations during the first decade of the 21st century.

**Microeconomic approach**

The problem is that there are too many gaps in the credit activity of the banking system. The specific issues include: there are the quality of the loans declines strong, the risk from the real estate credit and the loans increase at the banks in the first quarter and second quarter in 2015, the majority of them have the originate from credit balance of real estate. According to the reports from the credit of the institutions, the investment loans, the property business, the credit, and the foreign exchange quickly increase because the interest of two currencies is different

However, the foreign currency credit is tended to slow down from August to the end of 2015. The demand for foreign currency loans increases. Bad debt ratio is the difference between the assessment of Vietnam and the international organizations leading to the difficulty capital mobilization and the liquidity; became the deeply trouble of the banking system, the demand for the foreign currency loans increases. Appearing the transition of the mobilized capital from small commercial banks to large commercial banks made the total deposits of market run down. Performance measurement and financial measures of performance were criticized (Singh & Kumar, 2007) for: being short term oriented, considering past performance, being non consistent with current business's environment[25].

In fact of Vietnam, a lot of the companies or the banks manage the business operation only bases on the normal financial indicators. This is appropriate in the past, but today in the business world the enterprises are required to manage the firm based on a set of well-set indicators. The financial indicators are also necessary, but these only show us what is happened in the past, where the operations occurred. The financial indicators do not show us that what the problems shall be occur in the future and how the enterprise operation will be happen.

At the research level and moment, I do not encounter any research work that mentions the implementation BSC to evaluating and measuring the performance of Vietnamese banks. BSC is a good performance evaluation system by Harvard Business School professor Robert S. Kaplan and the rejuvenation of the Global Strategy Group's founder and president, David P. Norton. BSC shows the great vitality since it appeared. BSC is a new idea in performance management and applies to evaluate firm or bank performance through four dimensions: finance, customer, internal business processes, and learning and growth. The use of the BSC breaks the traditional single use financial indicators methods which measure performance. It adds the future drivers in the financial indicators, which is customer factors, internal business processes and employee learning and growth

**Speculation approach**

I believe that with opening of Vietnam to the world and the foreign investors after the research period (2015), the banking sector should start adopting holistic performance measurement systems such as the BSC to demonstrate with stakeholders that this sector is turning to exploit the financial and the non-financial measures to provide the investors with performance information. Therefore, a research work of this type is significant and worthy of investigation within the context of the banking sector in Vietnam. This work is expected that shall increase my understanding in this topic, bridge the gap of knowledge in this area, and attract the attention of the authorities in the Central Bank of Vietnam to consider the use of the BSC as a measurement and strategic performance tool in the banking sector in Vietnam.

The aim of this study is to apply BSC tool and Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), and Structural Equation Modelling (SEM) to analyse, measure, and evaluate firm performance of Vietnamese banks. In order to achieve this aim, the following objectives of the current study are advanced. To overview analysis the actual of the implementation BSC in the Vietnamese banks. To determine which factors of BSC actually would affect firm performance of Vietnamese banks. To test and generate model which is the best fit model used for the application and implementation BSC in Vietnamese banks. To propose potential solutions on enhancing efficiency of the implementation BSC in Vietnamese banks.

**LITERATURE REVIEW****The balanced scorecard approach**

The balanced scorecard (BSC) approach offered by previous studies addresses the issues of divergent stakeholder goals and gauging managers' effectiveness. Many researchers argue that existing performance measures are basically too reliant on financial-accounting measures. It is thus necessary to develop a monitoring system that communicates both financial and nonfinancial measures using two combinations of lagging and leading indicators to address a firm's long-term and short term objectives (Braam & Nijssen, 2004)[3]. Kaplan and Norton (1992) propose four balanced perspectives: financial, customer, internal business processes, and learning and growth perspective[16]. They contend that the BSC retains not only an emphasis on achieving financial objectives but also includes the performance drivers of these financial objectives. It is argued that the scorecard enables companies to track financial results while simultaneously monitoring progress in building the capabilities and

acquiring the intangible assets for future growth (Kaplan and Norton, 2005). Denton and White (2000, Fletcher and Smith (2004) suggest that, based on BSC, managers must evaluate their business from the four perspectives[6-7-18].

### **Interrelation among four perspective of balanced scorecard**

The BSC approach emphasizes that, in order to achieve objectives in the financial perspective, all objectives and measures in other perspectives should be linked (Gosselin, 2005)[8]. Olve, Roy and Wetter (2000) argued that improved value in human resource and development capital should be the leading indicators of improvement in customer capital and profitability.

### **Balanced scorecard and bank performance**

The relationship between BSC and organizational performance can be referred through several other similar studies. Sim and Koh (2001), Maiga and Jacobs (2003), Davis and Albright (2004), Hoque and Jame (2000) have found that there is relationship between BSC and performance[5-13-19-24]. They discovered that there is positive relationship in the use of non-financial measures, particularly, internal business process and innovation and learning measures, and organizational performance. Meanwhile, Ittner and Larcker (1998) proved that the leading indicators of non-financial performance[14]. Said, HassabElnaby, and Wier (2003) also in their study show that future accounting and market based returns can be linked to the use of non-financial measures[23]. In the year 2008, Jusoh, Ibrahim, and Zainuddin (2008) found in the context of Malaysian manufacturing industry, that there is a relationship between the usage of multiple performance measurements and organizational[15]. Anderson, Fornell, and Lehmann (1994), Abernethy and Lillis (1995), Perera, Harrison, and Poole (1997), Ittner and Larcker (1998) study recommend that the inability to link non-financial performance measures with economic performance does exist[1-2-14-21]. Findings from Govindarajan (1988) study specify that deemphasizing budget evaluative style is positively and significantly associated with strategic business unit effectiveness[9]. Based on the above literature review, this study develops and a framework to analyse the factors in the BSC how impacting to the performance of banks in Vietnam. More specifically, this study is analysed based on the method of EFA, CFA. In addition, the data analysis deeper and verification based on the analysis of SEM in this study. The next section the new point and the effectiveness of this research will be clarify through the specifically introduction about the application of the above method.

## **METHODS**

### **Research Hypotheses**

According to Davis and Albright (2004) confirmed the relationship between the internal performance measures and the implementation of BSC in banking industry[5]. Moreover, this research points out that there is a relationship between growth perspective, learning, and financial. Though the research objectives are mentioned above and the improvement from the previous study, the research hypotheses are proposed as follows:

*H1: The BSC has a positive impact on firm value (Tq).*

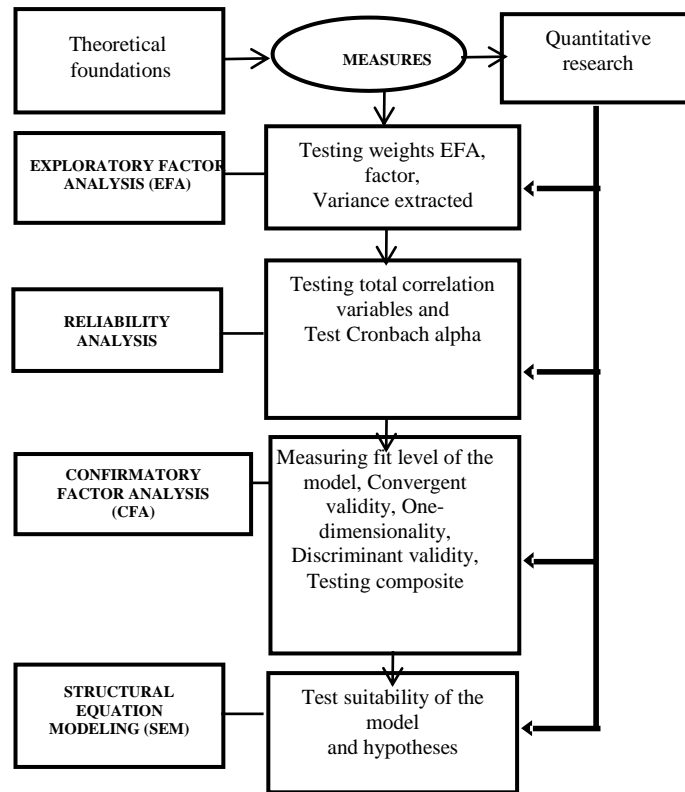
*H2: The BSC has a positive impact on earning per share (EPS).*

*H3: The BSC has a positive impact on stock return (Ri).*

According to Hoque, Sharee, and Alexander (2004) have found that there is relationship between BSC and performance[13]. One of the first researchers (Kaplan and Norton, 1992, 1996) the BSC would pave the way of balanced scorecard, and the comprehensive growth for the firms[16-17]. As the result, it is argued that the BSC as well as its four dimensions have a positive impact on firm performance. To test the argument, four hypotheses are proposed, one of which argues that the composite BSC indicator has a positive impact on firm performance. The hypothesis four are proposed as follows:

*H4: The BSC has a positive impact on firm performance of Vietnamese banks.*

### **Research Process**



**Figure 1: Research Process**  
*Source: The Author's Research*

**Data Collection**

The researchers in this field agree that this method requires a large sample size because it is based on large sample distribution theory (Raykov and Widaman, 1995)[22]. However, the data analysis methods used for this study was based on analysis of linear structural model SEM, to achieve the reliable estimation for this method, samples are usually large size with  $n > 200$  (Hoelter, 1983)[11]. EFA, traditionally, has been used to explore the possible underlying factor structure of a set of observed variables without imposing a preconceived structure on the outcome (Child, 1990).

Research process of this study is shown in Figure 1. This process is generally presented as follows:

*Step 1:* From theoretical foundations, the measures are proposed.

*Step 2:* For exploratory factor analysis, testing weights EFA, factor, variance extracted are preceded.

*Step 3:* For reliability analysis, testing total correlation variables and Cronbach's alpha are preceded.

*Step 4:* For confirmatory factor analysis, measuring fit level of the model, convergent validity, one-dimensionality, discriminant, and testing the composite reliability and the variance extracted of factors are preceded.

*Step 5:* For structural equation modeling, test suitability of the model and the hypotheses are preceded.

From the feature formation and the characteristics of each measures present above as well as to respond research objectives, we can easily recognize that the non-financial BSC aspect has two streams of information need being collected from two different objects. More specifically, information of customer dimension is collected from trading customers; both the internal business process dimension and the learning and growth dimension are collected from the managers. Thus, the data collection tools are designed as follows:

*Questionnaire Design:* The first tool is questionnaire. For non-financial aspect, two questionnaires are designed: a first questionnaire for the customer object, a second questionnaire for the manager object.

*Annual Statement:* The second tool is the annual statement of the banks. For the financial dimension of BSC and bank's performance, the data in the annual reports of 31 banks. Annual statement's information are used to calculate the nine financial indicators of the financial dimension of BSC and three indicators of bank's performance.

**EMPIRICAL RESULTS**

**Statistical analysis**

The questionnaires were personally delivered and collected from 2014 to 2015 to customers and managements in thirty one Vietnamese banks. There were totally 342 questionnaires to be delivered; however, these are only 335 questionnaires to be collected. All the data is collected through the 5-level Likert scale with questionnaires are described above. Before going further into deep data analysis which is the foremost focus of this study, it is necessary to discuss the structure of the survey objects as the basic information about this survey.

*Table 1: Descriptive Statistics Dimensions*

	Mean	Min	Max	Std.Dev-iation
Customer (CUS)	3.50	2	4.93	0.68
Internal Business Process (INT)	3.46	2	4.78	0.68
Learning and Growth (LEA)	3.46	2	4.29	0.72
Financial (FIN)	3.05	1	5.00	1.46
Firm performance of Vietnamese banks (PER)	3.90	1	5.00	1.14

As showed in this table, to explore about the BSC and PER, we have to learn about the dimension of them. This data shows that the dimensions of BSC and PER have a difference, because their mean value from 3.05 to 3.90. In BSC, the mean, min, max, and standard deviation of customer dimension is 3.50, 2, 4.93, and 0.68, and achieves the highest level of concentration. And the finance dimension achieves the lowest concentration, with mean, min, max, and standard deviation is 3.05, 1, 5, and 1.14. It mean that when BSC is done in Vietnam, the aspects of customer dimension achieve a fairly efficiency. The finance dimension is not.

**Reliability Analysis of the Independent Variable**

Hair et al. (2010) defined reliability analysis is an assessment of the degree of consistency between multiple measurements of a variable[10]. One of the most popular reliability statistics in use today is Cronbach's alpha (Cronbach, 1951)[4]. In testing Cronbach's Alpha, the item total correlation variable coefficients < 0.3 will be disqualified. measure is acceptable when the Cronbach's Alpha ≥ 0.6 (Nunnally and Burnstein, 1994). However, it should be noted that if the Cronbach's Alpha is too high (> 0.95). Results of Cronbach's alpha analysis of the measures are presented:

Customer Profit	0.923
Available Product	0.874
Customer satisfaction	0.886
The rate of customers	0.926
Internal Improvement	0.893
Internal Strategy	0.939
Learning and Growth	0.953
Finance indicators_1	0.848
Finance indicators_2	0.846

All of the Cronbach's alpha coefficients exceed the lower limit of acceptability, which is considered to be 0.6. Cronbach's alpha coefficient of financial indicators\_2 is lowest at 0.846 and internal business process is highest at 0.953

**Reliability Analysis of the Dependent Variable**

*Table 2: Reliability Analysis of the Dependent Variable*

Item-Total Statistics						
	Measure Mean if Item Deleted	Measure Variance if Item Deleted	Corrected Total Correlation	Squared Multiple Correlation	Cronbach's Alpha If Item Deleted	
E.2	7.87	3.783	.768	.703	.711	
E.3	7.87	3.716	.822	.731	.652	
E.1	7.68	5.292	.547	.313	.912	
Reliability Statistics						
Cronbach' Alpha	.839					

<b>Item-Total Statistics</b>					
	Measure Mean if Item Deleted	Measure Variance if Item Deleted	Corrected Total Correlation	Squared Multiple Correlation	Cronbach's Alpha If Item Deleted
E.2	7.87	3.783	.768	.703	.711
E.3	7.87	3.716	.822	.731	.652
Cronbach's Alpha Based on Standardized Items .836					
N of Items			3		

The Cronbach's Alpha for three items is 0.839, indicating that the items have strongly high internal consistency. All of the values of the 3 items in column corrected item-total correlation are greater than 0.3 as in table 2. Therefore, it is said that the 3 items of this factor is good enough to measure the factor named PER and PER is reliable for further analysis.

*Table 3: Summary Statistics*

<b>Summary Item Statistics</b>					
	Mean	Minimum	Maximum	Range	Maximum
Item Means	3.903	3.839	4.032	.194	1.050
Item Variances	1.304	1.032	1.473	.441	1.427
<b>Measure Statistics</b>					
Mean	11.71				
Variance	8.880				
Std. Deviation	2.980				
N of Items	3				

The summary statistics of PER are as shown in table 3 which shows that in the measure of 5 points of the measurement of the importance level. Because PER has the mean value of 11.71points.

**Testing Hypotheses Hypothesis H1, H2, H3**

Result of non-standardized estimation (or regression weight) of the parameters in the theoretical model. It shows that the relationship between the independent variables and the dependent variable is statistically significant or not. The standardized coefficients are presented in table 4. These indicate consider the level of impact between the independent variables and the dependent variable.

*Table 4: Standardized Regression Weights of SEM 1*

				Estimate
E.3	<---	CUS1		.907
E.3	<---	CUS2		-.550
E.3	<---	INT2		.285
E.3	<---	FIN1		-.939
E.3	<---	FIN2		1.230
E.2	<---	INT2		.343
E.2	<---	FIN2		1.373
E.2	<---	FIN1		-1.172
E.2	<---	CUS1		.867
E.2	<---	CUS2		-.525
E.1	<---	FIN1		-.687
E.1	<---	FIN2		.623
E.1	<---	CUS1		.618

The research results show that the dimensions of BSC have impact to firm value, earning per share and stock return of PER with P value < 0.05 as shown in table 3. However, the standardized coefficients have both of



positive sign (+) and negative sign (-) which consider that these variables have the directly proportional impact and the inversely proportional impact to E.1, E.2, and E.3. In addition, for each dimension of PER, only a few factors of BSC impacts it and this impact are not of the 4 dimension of BSC as shown in table 3.

**Table 5: Squared Multiple Correlations of SEM 1**

	Estimate
E.1	.414
E.2	.869
E.3	.809

The BSC's four dimensions explains 41.4% the change of Firm value dimension, 86.9 % the change of Earning per share dimension, 80.9 % the change of Stock return dimension of firm performance of Vietnamese banks as shown in table 5. Specifically, the impact of BSC's four dimensions to PER has been reviewed as follows:

These factors have a positive impact on the firm value dimension: FIN.1, FIN.2, and CUS.1 with  $\beta_{FIN.1} = 0.687$ ,  $\beta_{FIN.2} = 0.623$ ,  $\beta_{CUS.1} = 0.687$ . These factors INT.2, FIN.2, FIN.1, CUS.1, CUS.2 have impact to earning per share, the fact have strong impact is FIN.1 and FIN.2, with  $\beta_{FIN.1} = 1.172$ ,  $\beta_{FIN.2} = 1.373$ . The final, these factors have impact to Stock return are: CUS.1, CUS.2, INT.2, FIN.1, FIN.2 and the factor have the most impact is FIN.2 with  $\beta_{FIN.2} = 1.230$ .

The results of this evaluation, we can see more clearly the uneven impact of four dimensions of BSC to PER. Conclusion, the H1 (The BSC has a positive impact on firm value (Tq)), H2 (The BSC has a positive impact on earning per share (EPS)), H3 (The BSC has a positive impact on stock return (Ri)) are not accepted. Therefore, the process research is continued by testing hypothesis H4 and set up model SEM 2 to find out the impact of BSC to PER.

### Testing Theoretical Model SEM 2

Measurement model with the degree of freedom, 155, is presented. The SEM<sub>2</sub> result shows that the model achieves the compatible level with market data as following: Chi-square  $\chi^2 = 423.785$  ( $>0.05$ ), with p-value = 0.000; Chi-square/df = 2.7834 ( $\leq 3$ ); GFI = 0.956 ( $\geq 0.9$ ), AGFI = 0.997 ( $\geq 0.9$ ), CFI 0.955 ( $\geq 0.9$ ), TLI = 0.943 ( $\geq 0.9$ ); RMSEA = 0.042 ( $\leq 0.05$ ).

In addition, first result SEM<sub>2</sub>, P-value of measure CUS.3 (0.471) which affects to measure PER has not statistically significant ( $> 0.05$ ). After removing the three variables CUS.3, CUS.4 (0.541), INT.1 (0.4), the P value of the remaining variables have statistically significant (P-value  $<0.05$ ) In addition, the regression weights have both of the positive sign (+) and negative sign (-) which consider that these variables have the directly proportional impact and the inversely proportional impact to E.1, E.2, and E.3.

Therefore, we can say that the measure CUS.1, CUS.2, INT.2, FIN.1, FIN.2 achieve the convergence and value have an impact on PER. However, to offer accurate conclusions and a better model, testing theoretical models are continued to conduct.

The overall result of variables and relationships are retained after removing variables: CUS.1, CUS.2, INT.2, LEA, FIN.1, and FIN.2 => PER.

The model structure SEM 2 as show in Figure 2.

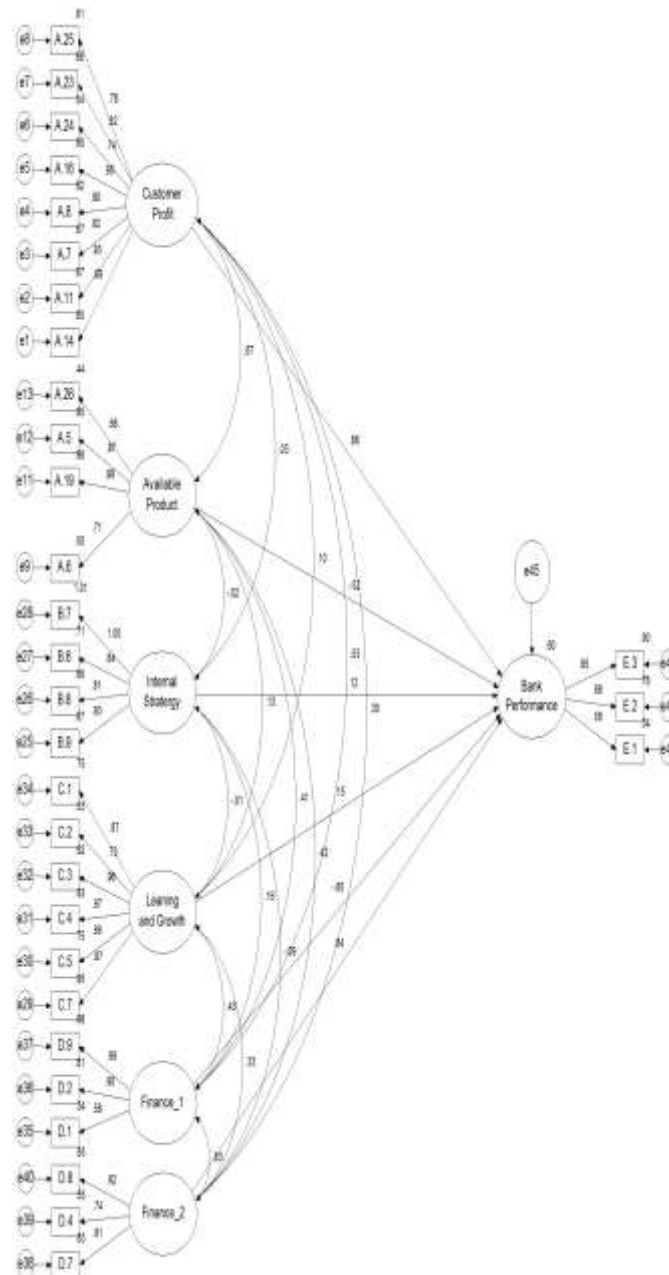


Figure 2: Structural SEM 2

From the results of model SEM<sub>2</sub> and although there are some measures removed, the remaining measures meet all four elements of the BSC. They are customer, internal business process, learning and growth, and the financial dimensions.

Therefore, the impact of the BSC to PER which meets 4 dimensions of BSC is shown in this model. This proves that the all of 4 dimensions of BSC have impact to the firm performance of Vietnamese’s banks.

Besides, this overall operation reflects the entire picture of the bank's operations not each individual index. This includes four dimensions and suitable with meaning of BSC; and consistent with the achievements of the previous studies. Furthermore, this model closely reflects the research objectives of the topic. Therefore, the model SEM<sub>2</sub> was chosen as the final results of this study. The results above are confirmed again by testing as follows.

**Testing Hypotheses Hypothesis 4**

**Hypothesis 4:** H4: The BSC has a positive impact on firm performance of Vietnamese banks.

Result of non-standardized estimation (or regression weight) of the parameters in the theoretical model. It



shows that the relationship between the independent variables and the dependent variable or not statistically significant, and the standardized coefficient are presented in table 6. These indicate consider the level of impact between the independent variables and the dependent variable.

**Table 6: Standardized Regression Weights of SEM 2**

			Estimate
PER	<---	CUS1	.861
PER	<---	CUS2	.819
PER	<---	LEA	.147
PER	<---	FIN1	.755
PER	<---	FIN2	.835
PER	<---	INT2	.118

The research results show that BSC's four dimensions have impact to PER. Specifically, hypothesis 4: the BSC has a positive impact on firm performance of Vietnamese banks are accepted because P-value is smaller than 0.05. However, the standardized coefficients have positive sign (+) which considers that these variables have the directly proportional impact to E.1, E.2, and E.3 as shown in table 6.

**Table 7: Squared Multiple Correlations**

Estimate	
PER	.602

Four dimensions of the BSC: customer, internal business process, learning and finance explain 60.2% the change of firm performance of Vietnamese banks as shown in table 7. Specifically, the impact of order 4 factors to PER has been reviewed as follows: the first is the two factors of the customer dimension CUS.1 and CUS.2 impact PER the strongest ( $\beta_{CUS.1} = 0.861$ ,  $\beta_{CUS.2} = 0.816$ ). The second is two factors FIN.2 and FIN.1 of The financial dimension ( $\beta_{FIN.2} = 0.835$ ,  $\beta_{FIN.1} = 0.755$ ). The third is factor LEA in the learning and growth dimension ( $\beta_{LEA} = 0.147$ ). The final is the factors INT.2 of the internal business process dimension with ( $\beta_{INT.2} = 0.118$ ).

This result confirms again the conclusions of this study. The model SEM<sub>2</sub> was chosen as the final model for this study which achieves the study objectives of this study.

## CONCLUSION

This study has successfully built the measures; special, successfully built the structural equation modeling to find out the impact of four dimension of BSC to firm performance of Vietnamese banks. From there, assessing the implementation of the BSC in Vietnam and proposing the opinions and the solutions for Vietnamese banking sector.

### The measures

In general, in this study the measurable results show that measures are built and tested on the international market can be used for studying in Vietnam through adjustments and additions in accordance with the actual conditions. In studying aspect, the results of these measures which are consider as the basis for further research in this field, are study's distributions. In the practical aspect, four dimension of BSC as customer, internal business process, learning and growth, and finance have an important role to performance of the Vietnam banks. Therefore, these measures help the managers to measure bank performance in the banking BSC Vietnam.

### The Theoretical Models

The test results of structural equation modeling (SEM) considered that the theoretical model has achieved compatibility level with data. Specially, three theoretical models are proposed. One theoretical model which is named H<sub>4</sub>. Furthermore, all of four dimensions have one-dimensional impact to PER. From these result and conclusions above, the distribution of this thesis are became highlight. The model SEM 2 is an important contributor to firm performance of Vietnamese banks. It appears to be the first study to combine the BSC with structural equation modeling (SEM) to find out the best fit model for Vietnamese banks. Beside, this study research about how Vietnamese banks use the BSC as a tool which is applied to commercial banks performance operation and management system.

In addition, this study contributes to the existing literature in adopting SEM to the efficiency and inefficiency of Vietnamese banks. It is extremely important to maintain competitive advantages as business activities of the banks are always facing a changing market and serious competition. To maintain and develop in the market place, banks should put their efforts in implementation BSC effectively. SEM has provided the best result of significant impact of BSC's factors to PER. Although SEM is still not a popular technique for test and evaluation efficiency of banks, it is expected that the results of the study can serve as one of the most important references for banks to improve their operation.

## REFERENCE

- [1] Abernethy, M., & Lilis, A. M. (1995). "The Impact of Manufacturing Flexibility on Management Control System Design". *Accounting, Organization and Society*, 20(4), 241-258.
- [2] Anderson, E. W., Fornell, C., & Lehmann, D. R. (1994). "Customer Satisfaction, Market Share, and Profitability: Findings From Sweden". *Journal of Marketing*, 58(3), 53-66.
- [3] Braam, G. J. M., & Nijssen, E. J. (2004). "Performance Effects of Using the Balanced Scorecard". *Long Range Planning*, 37(4), 335-349.
- [4] Cronbach, L. J. (1951). "Coefficient Alpha and the Internal Structure of Tests". *Psychometrika*, 16(3), 297-334.
- [5] Davis, S., & Albright, T. (2004). "An Investigation of the Effect of Balanced Scorecard Implementation on Financial Performance". *Management Accounting Research*, 15(2), 135-153.
- [6] Denton, A. G., & White, B. (2000). "Implementing a Balanced Scorecard Approach to Managing Hotel Operations". *Cornell Hotel and Restaurant Administration Quarterly*, 41(1), 94-107.
- [7] Fletcher, H. D., & Smith, D. B. (2004). "Managing for Value: Developing a Performance Measurement System Integrating Economic Value Added and the Balanced Scorecard in Strategic Planning". *Journal of Business Strategies*, 21, 1-17.
- [8] Gosselin, M. (2005). "An Empirical Study of Performance Measurement in Manufacturing Firms". *International Journal of Productivity and Performance Management*, 54(5/6), 419-437.
- [9] Govindarajan, V. (1988). "A Contingency Approach to Strategy Implementation at the Business Unit Level: Integrating Administrative Mechanisms With Strategy". *Academy of Management Journal*, 31(4), 828-853.
- [10] Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). "Multivariate Data Analysis (7th ed.)". *Upper Saddle River, New Jersey: Prentice Hall*.
- [11] Hoelter, J. W. (1983). "Factorial Invariance and Self-Esteem: Reassessing Race and Sex Differences". *Social Forces*, 61(3), 853-846.
- [12] Hoque, Z., & James, W. (2000). "Linking Balanced Scorecard Measures to Size and Market Factors: Impact on Organizational Performance". *Journal of Management Accounting Research*, 12, 1-17.
- [13] Hoque, Z., Sharee, A., & Alexander, R. (2004). "Policing the Police Service: An Exploratory Case Study of the Rise of New Public Management" within an Australian police service". *Accounting, Auditing and Accountability Journal*, 17(1), 59-84.
- [14] Ittner, C. D., & Larcker, D. F. (1998). "Are Non Financial Measures Leading Indicators of Financial Performance? An Analysis of Customer Satisfaction". *Journal of Accounting Research*, 36, 1-35.
- [15] Jusoh, R. R., Ibrahim, D. N., & Zainuddin, Y. (2008). "The performance consequence of Multiple Performance Measures usage: Evidence from the Malaysian Manufactures". *International Journal of Productivity and Performance Management*, 57(2), 119-136.
- [16] Kaplan, R. S., & Norton, D. P. (1992). "The Balanced Scorecard-Measures that Drive Performance". *Harvard Business Review*, 70(1), 71-79.
- [17] Kaplan, R. S., & Norton, D. P. (1996). "Translating Strategy into Actions: The Balanced Scorecard". *Boston, MA: Harvard Business School Press*.
- [18] Kaplan, R. S., & Norton, D. P. (2005). "The Balanced Scorecard: Measures That Drive Performance". *Harvard Business Review*.
- [19] Maiga, A. S., & Jacobs, F. A. (2003). "Balanced scorecard, activity-based costing and company performance: an empirical analysis". *Journal of Managerial Issues*, 15(3), 283-301.
- [20] Olve, N.-G., Roy, J., & Wetter, M. (2000). *Performance Drivers: A Practical Guide to Using the Balanced Scorecard*. Chichester: John Wiley & Sons, Ltd.
- [21] Perera, S., Harrison, G., & Poole, M. (1997). "Customer Focused Manufacturing Strategy and the Use of Operations Based Non Financial Performance Measures: A Research Note". *Accounting, Organization and Society*, 22(6), 557-572.
- [22] Raykov, T., & Widaman, K. F. (1995). "Issues in Applied Structural Equation Modeling Research". *Structural Equation Modeling*, 2, 289-318.
- [23] Said, A. A., HassabElnaby, H. R., & Wier, B. (2003). "An Empirical Investigation of the Performance Consequences of Non Financial Measures". *Journal of Management Accounting Research*, 15, 193-223.

- [24] Sim, K. L., & Koh, H. C. (2001). "Balanced Scorecard: A Rising Trend in Strategic Performance Measurement". *Measuring Business Excellence*, 5(2), 18-26.
- [25] Singh, M., & Kumar, S. (2007). "Balanced Scorecard Implementations-Global and Indian Experiences". *Indian Management Studies Journal*, 11, 21-39.