

**INTEGRATED PERFORMANCE MEASUREMENT SYSTEM  
STRATEGY AND FIRM SUCCESS: AN EMPIRICAL  
INVESTIGATION OF THAI-LISTED FIRMS**

**PANNARAI LATA**

**A dissertation submitted in partial fulfillment of the requirements for  
the degree of Doctor of Philosophy in Accounting  
at Maharakham University**

**January 2017**

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The examining committee has unanimously approved this dissertation, submitted by Mrs. Pannarai Lata, as a partial fulfillment of the requirements for the degree of Doctor of Philosophy in Accounting at Mahasarakham University.

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### **ABSTRACT**

Integrated performance measurement system strategy has been considered as a key success factor in performing under fluctuating business environments. Drawing on the resource-based view (RBV) and contingency theory, the objective of this research is to investigate the effect of integrated performance measurement system strategy on firm success of Thai-listed firms through the mediating influence of its four consequences, namely, sustainable organizational commitment, organizational citizenship behavior, continuous organizational loyalty, and organizational competitiveness. Besides, five antecedent variables which consist of top management support, organizational learning dynamism, best management accounting system, competitive environment intensity, and information technology complementarity, together with a moderating variable which is accounting competency, are used for examining the influence on integrated performance measurement system strategy. The data was collected from a survey of 153 Thai-listed firms of which their accounting executive (e.g. accounting director, accounting manager) is the key informant. The nineteen hypothesized relationships among variables are tested by using ordinary least square regression analysis.

Results show that market value-based appraisal orientation and value-added evaluation emphasis, treated as dimensions 1 and 4, are important determinants to yield higher organizational citizenship behavior and continuous organizational loyalty, which both two mediating variables positively influence organizational competitiveness and firm success, respectively. Moreover, the results reveal that market value-based appraisal orientation has a positive effect on four outcomes: sustainable organizational commitment, organizational citizenship behavior, continuous organizational loyalty, and organizational competitiveness. In addition, accounting-oriented measurement



capability has a positive influence on sustainable organizational commitment. Indicator-based assessment focus has a positive effect on organizational citizenship behavior and organizational competitiveness. Value-added evaluation emphasis positively affects three outcomes: sustainable organizational commitment, organizational citizenship behavior, and continuous organizational loyalty. Finally, a revenue-oriented criterion implementation is positively associated with organizational citizenship behavior and organizational competitiveness.

Interestingly, organizational citizenship behavior and continuous organizational loyalty have a positive impact on organizational competitiveness. In addition, organizational competitiveness has a strong positive influence on firm success.

Moreover, both internal and external determinants have a positive impact, at least partly or wholly, on building the integrated performance measurement system strategy. Especially, organizational learning dynamism seems to be the most crucial because it has a significant and positive impact on all dimensions of integrated performance measurement system strategy. Likewise, top management support has a positive effect on market value-based appraisal orientation, accounting-oriented measurement capability, indicator-based assessment focus, and value-added evaluation emphasis. Moreover, the best management accounting system has a positive effect on accounting-oriented measurement capability, indicator-based assessment focus, value-added evaluation emphasis, and revenue-oriented criterion implementation. Competitive environment intensity has a positive influence on indicator-based assessment focus and revenue-oriented criterion implementation.

Meanwhile, accounting competency plays a significant moderating role only on the relationships between competitive environment intensity and indicator-based assessment focus. Finally, some theoretical and managerial contributions, conclusions, and suggestions for future research have also been discussed.



## TABLE OF CONTENTS

Chapter	Page
I INTRODUCTION .....	1
Overview .....	1
Purposes of the Research .....	8
Research Questions .....	9
Scope of the Research .....	10
Organization of the Dissertation .....	12
II LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK .....	13
Theoretical Foundation .....	13
Relevant Literature Review and Research Hypotheses .....	18
Integrated Performance Measurement System Strategy (IPMSS)	
Background .....	20
Integrated Performance Measurement System Strategy and Its Consequences.....	43
The Effects of Antecedent variables on Integrated Performance Measurement System Strategy.....	63
The Moderating Effects of Accounting Competency .....	73
Summary .....	78
III RESEARCH METHODS .....	86
Sample Selection and Data Collection Procedure .....	86
Measurements .....	91
Methods .....	98
Statistical Techniques .....	101
Summary .....	106



<b>Chapter</b>	<b>Page</b>
IV RESULTS AND DISCUSSION .....	116
Respondent Characteristics and Descriptive Statistics .....	116
Hypotheses Testing and Results .....	120
Summary .....	147
V CONCLUSION .....	157
Summary of Results .....	159
Theoretical and Managerial Contributions .....	164
Limitations and Future Research Directions .....	167
BIBLIOGRAPHY .....	169
APPENDICES .....	200
APPENDIX A The Original Items .....	201
APPENDIX B Item Factor Loadings and Reliability	
Analyses in Pre-Test .....	207
APPENDIX C Respondent Characteristics .....	211
APPENDIX D Demographic of Firm Characteristics .....	213
APPENDIX E Test of Non-Response Bias .....	216
APPENDIX F Test the Assumption of Regression Analysis .....	218
APPENDIX G Cover Letter and Questionnaire: Thai Version .....	233
APPENDIX H Cover Letter and Questionnaire: English Version .....	248
APPENDIX I Letters to the Experts .....	265
VITA .....	268



## LIST OF TABLES

Table	Page
1 The Definitions of Integrated Performance Measurement System Strategy .....	25
2 Summary of Integrated Performance Measurement System Strategy Sheet .....	28
3 Summary of Key Literature Review on Integrated Performance Measurement System Strategy .....	38
4 Summary of Hypothesized Relationships .....	79
5 Details of Questionnaire Mailing .....	88
6 Results of Validity and Reliability Testing .....	100
7 Definitions and Operational Variables of Constructs .....	108
8 Descriptive Statistics and Correlation Matrix of Integrated Performance Measurement System Strategy and all Constructs .....	119
9 Descriptive Statistics and Correlation Matrix of Integrated Performance Measurement System Strategy and Its Consequences .....	122
10 Results of Regression Analysis for the Effects of Integrated Performance Measurement System Strategy on Its Consequences .....	129
11 Descriptive Statistics and Correlation Matrix of Integrated Performance Measurement System Strategy Consequents and Firm Success .....	131
12 Results of Regression Analysis for the Effects of Integrated Performance Measurement System Strategy Consequents on Firm Success .....	134
13 Descriptive Statistics and Correlation Matrix of Each Dimension of Integrated Performance Measurement System Strategy, Its Antecedences, and Accounting Competency .....	137
14 Results of Regression Analysis for the Effects of Antecedents on Integrated Performance Measurement System Strategy .....	142
15 Results of Regression Analysis for the Moderating Effects of Accounting Competency .....	146



## LIST OF TABLES

Table	Page
16 A Summary of the Results of Hypotheses Testing .....	152
17 A Summary of the Results in All Research Questions .....	160



## LIST OF FIGURES

Figure	Page
1 A Conceptual Model of the Relationships between Integrated Performance Measurement System Strategy and Firm Success .....	19
2 The Effects of Integrated Performance Measurement System Strategy on Sustainable Organizational Commitment, Organizational Citizenship Behavior, Continuous Organizational Loyalty, and Organizational Competitiveness .....	43
3 The Effects of Sustainable Organizational Commitment, Organizational Citizenship Behavior, and Continuous Organizational Loyalty on Organizational Competitiveness .....	57
4 The Effect of Organizational Competitiveness on Firm Success .....	62
5 The Effects of the Antecedents on Integrated Performance Measurement System Strategy .....	64
6 Roles of Accounting Competency as a Moderator .....	73
7 Results of the Effects of Integrated Performance Measurement System Strategy on Sustainable Organizational Commitment, Organizational Citizenship Behavior, Continuous Organizational Loyalty on Organizational Competitiveness.....	120
8 Results of the Effects of Integrated Performance Measurement System Strategy Consequents on Firm Success .....	130
9 Results of the Effects of Antecedents on Integrated Performance Measurement System Strategy .....	135
10 Results of the Moderating Effects of Accounting Competency .....	143
11 Model Summary of the Results of the Hypotheses Testing .....	163





## CHAPTER I

### INTRODUCTION

#### Overview

The changing global economic environment regarding globalization, trade, employment, income, inflation, interest rates, productivity, and wealth, that influence the buying behavior of consumers and institutions, causes many firms to be unavoidably affected by macro-environmental factors (Levius, 2016). After the globalization of trade and the emergence of the world economy, markets became competitive; customers have more demands, and the manufacturing philosophies of the private sector change continuously (Khan and Shah, 2011). These changes force firms and their managers need to seek new strategies or methods to create and improve their goal under the rigid competitive circumstances, and also to prepare to cope with a variety of impacts on the organizations in the future (Kumar and Shafabi, 2011). A majority of successful firms relies on many techniques and instruments for their business management, such as diverse strategies, human resource management techniques, management accounting practices, information technology, and performance measurement system strategy (Aracıoğlu, Zalluhoğlu and Candemir, 2013; Haldma and Laats, 2002).

Mostly, one of the crucial requirements is the firm's ability to follow-up, monitor, and control their overall performance by the way of selecting to use the performance measurement system strategy or measures to be suitable for the style of each organizational operation and management (Merchant and Van der Stede, 2007). Afterward, a performance measurement system has become the most important issue for academics and organizations because it is used for the main purpose of ensuring that every decision-making effort is in the right direction, and checks for the progress of goals and objectives of the organizations (Bhatti, Awan and Razaq, 2014). Additionally, a performance measurement system strategy is also the process of measuring the efficiency and effectiveness of purposeful action (Marc et al., 2010; Waggoner, Neely and Kennerley, 1999). Similarly, integrated performance measurement system strategy (IPMSS) can provide both a source of decision-facilitating information together with



applying to be the instrument for stimulating managers to be able to appropriately choose more relevant information (Burney and Widener, 2007; Melnyk et al., 2014).

In the accounting management field, the evolution of the performance measurement system has been divided into the two phases (Gomes, Yasin and Lisboa, 2004; Khan and Shah, 2011). In the first phase (from the late 1880s to the early 1980s), organizations focused on cost accounting orientation of performance measurement and internal control systems, and key techniques which were often used by firms, namely cost variance analysis, standard costing and flexible budgets (Bourne et al., 2003). During the 1940s to 1950s, productivity concepts had emerged in manufacturing organizations (i.e. quality control, variety reduction, standardization) to lead to more emphasis on financial measures such as sales, production, efficiency, profit, return on investment and other financial ratios (Bititci et al., 2009). Financial measures became the important part of performance measurement and were brought to apply to develop cost accounting and to manage whole control systems (Keegan, Eiler and Jones, 1989).

After 1980, due to the changes in the business environment, the increasing intensity of competition in global markets, high technologies, and the globalization of trade and the emergence of world economy, a perspective of the firm's performance measurement had shifted from productivity concepts to quality, time, cost, flexibility, and customer satisfaction instead (Hayes and Abernothy, 1980; Khan and Shah, 2011). Moreover, traditional financial measures had been criticized as inappropriate for measuring business performance (Kurien and Qureshi, 2011). Johnson and Kaplan (1987) were the first groups to have suggested that firms should shift from cost accounting orientation to the integrated approach in performance measurement system. Later, the emergence of balanced performance measurement frameworks had started on the second phase of performance measurement system evolution to focus on the use of performance measures to give a holistic view of the organization. Thus, non-financial measures began to be necessary for monitoring performance and motivating the work of employees, and because it could provide outcomes to be timely, measurable, precise, meaningful, and flexibility, as well as it facilitated to improve the certain part of business operations to consistent with firm's goal and strategies (Kaplan and Norton, 1996; Kurien and Qureshi, 2011; Medori and Steeple, 2000).



Since 1990, the integrated performance measurement frameworks have been continuously designed and developed by academics to facilitate firms to lead such frameworks to apply for creating and developing their integrated performance measurement system strategy to be appropriate for the context and style of each firm. Performance Measurement Matrix is the first framework that has been accepted as a balanced or integrated system to measure business performance by Keegan, Eiler and Jones (1989). Then, various frameworks have been presented and popularized to apply to firms; for example, Performance Measurement Questionnaire by Dixon, Nanni and Vollmann (1990); Results and Determinants Framework (Fitzgerald et al., 1991); SMART: Strategic Measurement and Reporting Technique Pyramid by Lynch and Cross (1991); Balanced Scorecard by Kaplan and Norton (1996); and Performance Prism (Neely, Adams and Crowe, 2001). In addition, various frameworks focus on information related to the multiple dimensions of several internal and external drivers, as well as non-financial and financial measures, such as Tangen (2004), Abran and Buglione (2003), Horváth and Seiter (2009), and The Multi-Criteria Performance Measurement Model (Kasie and Belay, 2013).

When the balanced or integrated performance measurement frameworks are transformed from each firm to be integrated performance measurement system strategy (IPMSS), it is perceived by firms as an integrated set of several metrics or measures for quantifying the efficiency and effectiveness of the organization's actions (Gladen, 2011; Neely, Gregory and Platts, 2005). In detail, the set of diverse metrics or measures should include financial and non-financial measures, long and short-term measures; internal and external measures together in order to support the right decision-making processes through gathering, processing, analyzing, quantifying information about performance; and presenting performance outcomes in the form of a brief overview (Aracıoğlu, Zalluhoğlu and Candemir, 2013; Bisbe and Malagueno, 2012; Gimbert, Bisbe and Mendoza, 2010). IPMSS plays an important role and is brought to use for evaluating both overall and sub-units performances, controlling whole operations; and measuring and comparing the difference in performance between businesses in the same industry, or departments, teams, and individuals within the firms (Bhatti, Awan and Razaq, 2014; Ghalayini and Noble, 1996; Parmenter, 2009). Furthermore, it can give managers information to track the implementation of business strategy by using the



comparison of actual performance against organizational strategic goals (Simons, 2000). When integrated performance measurement system strategy is the best, it will improve the efficiency of allocating responsibilities, deciding and setting targets, tracking the progress of plans, and rewarding outcomes (Merchant and Van der Stede, 2007). Moreover, when firms have a contemporary integrated performance measurement system strategy, firms can translate business strategies into deliverable results by combining financial measures, strategies, and operational business together to gauge that they are going to achieve and meet their targets and objectives (Hall, 2008). In addition, the comprehensive of IPMSS can reflect completely organizational performance and value-added creation which is according to the firm's strategy (Giovannoni and Maraghini, 2013).

As for traditional problematic issues, managers rely solely on financial measures to support decision-making and evaluate performance in the organization (Anthony and Govindarajan, 2001; Berry, Broadbent and Otley, 2005). On the other hand, the traditional performance measurement system has been heavily criticized for several reasons (Johnson and Kaplan, 1987; Kaplan and Norton, 1992) as follows: 1) it presents a one-sided view of operational activities, making effective, coordination difficult; 2) it lacks strategic focus and fails to provide information that has quality, flexibility, and responsiveness; 3) it encourages managers to reduce the variances from the standard rather than seek to continually improve; 4) it fails to offer information on what customers want and how the firm's competitors are performing, and 5) it emphasizes measuring the historical information. The performance measurement system in the second phase shifts from the cost accounting orientation to the integrated performance measurement approach, for which the performance measurement system has been designed and developed, depends on the organization's strategy only. The well-designed and developed integrated performance measurement system strategy does not only depend on the organization's strategy, but also should be created from the stakeholder's needs and satisfactions perspectives of customers (Neely, Adams and Crowe, 2001). Moreover, the limitations of Balanced Scorecard have been criticized in that it still lacks other main perspectives in performance measurement, such as market, employees, suppliers, community, and stakeholders (Flak and Dertz, 2004; Kasie and Belay, 2013). Thus, many organizations have started to modify its scorecard to make it



suitable for their usage (Bhatti, Awan and Razaq, 2014; Burney and Swanson, 2010; Xiao-le, Hong-Jun and Potter, 2010).

Furthermore, to meet operational success under the current dynamic business environment, the performance measurement system of each firm needs to combine financial and non-financial measures together to capture a complete picture of overall organizational performance, and can monitor whether the customers' needs are met and has kept the organizational cost under control. Moreover, Tangen (2004) more supports that the contemporary integrated performance measurement system strategy should be derived from a firm's strategic objectives, have an appropriate balance which should not be seen solely from a financial perspective, can protect against sub-optimization and avoid dysfunctional or unanticipated behavior, and should have a limited number of performance measures to reduce the risk of information overload.

The previous literature reviews on the integrated performance measurement system strategy (IPMSS) find that IPMSS has the most important role in establishing and improving firm success and performance (Bisbe and Malagueño, 2012; Bhatti, Awan and Razaq, 2014; Kasie and Belay, 2013; Lee and Yang, 2011). In addition, IPMSS still has a positive impact on managerial performance when it is associated with employee commitment (Lau and Moser, 2008). It can improve employee satisfaction (Burney and Swanson, 2010; Karimi, Malik and Hussain, 2011; Rompho and Siengthai, 2012), organizational citizenship behaviors (Burney, Henle and Widener, 2009), and enhance competitiveness and motivate of employees works in accordance with goals of the organization (Tättilä, Helkiö and Holmström, 2014). Correspondingly, IPMSS can increase the effectiveness of the firm's performance through individual and learning about the organization (Batac and Carassus, 2009; Fried, 2010). Johnson, Davis and Albright (2009) have found that IPMSS has a positive impact on a firm's employee attitudes (i.e. job satisfaction, pay satisfaction, organizational commitment and justice). Besides, IPMSS can reduce to lower levels of ambiguity and conflict when the strategic performance measurement systems closely link to organizational strategy (Burney and Widener, 2007; Hall, 2008). However, prior empirical studies just examined the impact of the performance measurement system on firm outcome, but only little research focuses on the strategic capability of an integrated approach, and investigates the new dimensions of IPMSS. It still lacks the linkage of the relationship between the ability of



firms to implement IPMSS, the behavior of members within the firm, competitiveness, and firm success. In addition, prior studies lack an examination of the key internal and external factors which influence the success of IPMSS implementation.

For the reasons above, this research has focused on the organizational behavior regarding the firm's ability of integrated performance measurement system strategy, the behavior of organizational members, organizational competitiveness, and firm success. In this research, "integrated performance measurement system strategy" is defined as the firm's capabilities to apply the diverse methods and metrics for tracking overall organizational performance, monitoring the progress related to strategic objectives and action plans, allocating responsibilities, supporting the right decision-making, setting performance targets and rewarding outcomes (Kasie and Belay, 2013; Merchant and Van der Stede, 2007; Neely, Gregory and Platts, 2005). The five dimensions of IPMSS have been adopted from Kasie and Belay (2013). It is the incorporation of essential performance measurement perspectives, both from the four perspectives of Kaplan and Norton (1992) balanced scorecard; and the perspectives of social and environmental, employee, market, and supplier partnership in Performance Prism (Neely, Adams and Crowe, 2001) in order to terminate of defects and weaknesses of the traditional performance measurement system. Especially, this research adds the perspective of using the set of diverse measures that combine financial and non-financial measures, long and short-term measures, and internal and external measures (Ittner, Larcker and Randall, 2003). Moreover, the performance objective of increasing market efficiency is added in market value-based appraisal orientation (first dimension). The performance perspective of cost accounting and measures have been added to the second dimension. Similarly, new measures are added to the definition of every dimension to fit and comply with the current environment and can capture the complete picture of overall performance. Therefore, the integrated performance measurement system strategy (IPMSS) has five dimensions as follows: 1) market value-based appraisal orientation; 2) accounting-oriented measurement capability; 3) indicator-based assessment focus; 4) value-added evaluation emphasis; and 5) revenue-oriented criterion implementation.

From the previous literature reviews, the empirical research of an integrated performance measurement system strategy has integrated two theories to describe whole phenomena in relevant relationships, namely, the resource-based view (RBV) and the



contingency theory to be utilized to enhance knowledge and to explain the relationship between all variables. In this research, the RBV is utilized to describe the relationship between IPMSS and its consequence. The contingency theory brings to use to explain the relationship among IPMSS, its antecedent variables, and moderator.

The resource-based view (RBV) provides for the fundamental understanding of the assertion that IPMSS can act as strategic resources which influence sustainable competitive advantage and superior performance. Organizational capabilities are the processes by which companies acquire or develop their resources (Day, 1994). These capabilities are enhanced or created by the various uses of performance measurement systems for analysis and interactive purposes (Grafton, Lillis and Widener, 2010; Henri, 2006; Marginson, 2002; Mundy, 2010). The use of performance measurement systems helps facilitate strategy implementation and enhance organizational performance (Davis and Albright, 2004). It still has an influence on the efficiency and effectiveness of the firm's performance through employees' positive attitudes and behaviors. As a result, the resource-based view (RBV) is employed in this research to explain that IPMSS affects sustainable organizational commitment, organizational citizenship behavior, continuous organizational loyalty, organizational competitiveness, and firm success.

The contingency theory is utilized to provide the initial understanding for the assertion that organizational effectiveness is achieved by matching organizational characteristics to contingencies (Morton and Hu, 2008). The contingency theory is concerned with the survival of the organization that fits with its environment. The contingency theory posits that there is no one best strategy related to performance (Robles, 2011). Meanwhile, competitive environment intensity and information technology complementarity are the external environmental factors which play a significant role in determining a firm's success. The contingency theory helps explain the relationship between the firms' characteristics such as performance measurement system strategy and firm performance that depend on upon specific contingencies of each firm (Donaldson, 2001). Therefore, the key premise of this research can be specified that IPMSS cannot be universally appropriate. The suitable use of IPMSS of each firm and their effect depends on the contingency theory to identify the appropriate factor between the contextual factors and their design of management control system which is relevant to superior organizational performance (Chenhall, 2003; Ittner and





Larcker, 1997; Lee and Yang, 2011; Luft and Shields, 2003). Firms need to design their own internal system according to circumstances to avoid loss of performance. In previous literature review, this theoretical approach has been adopted to focus on specific contingencies that have most important determinants of integrated performance measurement system strategy usage, such as firm size and industry, knowledge about management tools, strategic orientation, and environmental uncertainty (Hoque, 2004; Ittner, Larcker and Randall, 2003; Marc et al., 2010). Consequently, five antecedent variables include: 1) competitive environmental intensity, 2) information technology complementarity (all be defined as external factors), 3) top management support, 4) organizational learning dynamism, and 5) best management accounting system to be set as internal factors. Those antecedent variables influence firm successes based on the contingency theory.

Consequently, this research generates a significant study of literature reviews on integrated performance measurement system strategy (IPMSS). Firstly, it expands theoretical contributions to the previous knowledge and literature of IPMSS. Secondly, this research proposes the five dimensions of the integrated performance measurement system strategy, including 1) market value-based appraisal orientation, 2) accounting-oriented measurement capability, 3) indicator-based assessment focus, 4) value-added evaluation emphasis, and 5) revenue-oriented criterion implementation; whereas they are rarely included in the prior research. Thirdly, the two theories consist of the RBV and the contingency theory to be applied to back up and explain the relationships all variables of the conceptual model in this research. Moreover, the antecedents and consequences of IPMSS are offered by this research in different ways. Finally, this research has tested all relationships.

### **Purposes of the Research**

The key research objective of this research is to investigate the effects of integrated performance measurement system strategy on firm success. In addition, the specific objectives are also as follows:

1. To investigate the effect of each dimension of integrated performance measurement system strategy on sustainable organizational commitment, organizational





citizenship behavior, continuous organizational loyalty, and organizational competitiveness,

2. To investigate the effect of sustainable organizational commitment, organizational citizenship behavior, and continuous organizational loyalty on organizational competitiveness,

3. To examine the effect of organizational competitiveness on firm success,

4. To examine the influences of top management support, organizational learning dynamism, best management accounting system, information technology complementarity, and competitive environment intensity on integrated performance measurement system strategy, and

5. To test the moderating effects of accounting competency that influences the relationship between top management support, organizational learning dynamism, best management accounting system, information technology complementarity, and competitive environment intensity; and each dimension of integrated performance measurement system strategy.

### **Research Questions**

The key research question is, “How does integrated performance measurement system strategy affect firm success?” Moreover, there are the specific research questions as follows:

1. How does each dimension of integrated performance measurement system strategy influence sustainable organizational commitment, organizational citizenship behavior, continuous organizational loyalty, and organizational competitiveness?

2. How do sustainable organizational commitment, organizational citizenship behavior, and continuous organizational loyalty influence organizational competitiveness?

3. How does organizational competitiveness affect firm success?

4. How do top management support, organizational learning dynamism, best management accounting system, information technology complementarity, and competitive environment intensity influence each dimension of integrated performance measurement system strategy?



5. How does accounting competency moderate the relationships between top management support, organizational learning dynamism, best management accounting system, information technology complementarity, competitive environment intensity, and each dimension of integrated performance measurement system strategy?

### **Scope of the Research**

The resource-based view (RBV) and the contingency theory are utilized to enhance the knowledge and emphasize the importance of this research. The RBV perspective is a firm's internal process to generate a resource bundle which can become the means of creating and sustaining a firm's competitive advantage. The resources are comprised of a combination of assets and capabilities that create firm competitiveness and firm performance (Barney, 1991). The resource-based view has been adopted to explain the impact of the integrated performance measurement system strategy which can act as a strategic capability to improve organizational capabilities. Organizational capabilities are the processes by which companies acquire or develop their resources (Day, 1994). These capabilities are enhanced or created by the ability of performance measurement system for analysis and interactive purposes (Grafton, Lillis and Widener, 2010; Henri, 2006; Marginson, 2002; Mundy, 2010). The use of IPMSS facilitates strategy implementation and enhances organizational performance (Davis and Albright, 2004). It also has an influence on the efficiency and effectiveness of performance through employees' attitudes and behaviors which are emphasized by the organization. Therefore, the resource-based view is employed to investigate whether IPMSS affects sustainable organizational commitment, organizational citizenship behavior, continuous organizational loyalty, organizational competitiveness and firm success. Moreover, the contingency theory hypothesizes that organizational structure is a function of context, a context that is simultaneously determined by both external and internal environments (Anderson and Lenen, 1999). This theory is presented completely by Fiedler (1967) who explained that there is no better way to organize a corporation than to approach the organizational management based on situations or the environment of each firm, so that organizational effectiveness will be often achieved by matching the organizational characteristics and its environment (Morton and Hu, 2008). Besides, it is concerned



with the survival of the organization that fits with its environment. In this research, competitive environmental intensity and information technology complementarity are the external environmental factors which have an important role in determining success. Meanwhile, top management support, organizational learning dynamism, and best management accounting system are internal factors which have an effect on generating IPMSS of the firm based on the contingency theory. Both theories illustrate and support the relationships between the five dimensions of IPMSS, its consequences, antecedents, and moderator. This research proposes two theories to describe the relationships among all variables through attention in examining and answering the research questions and objectives.

Integrated performance measurement system strategy (IPMSS) consists of five dimensions: market value-based appraisal orientation, accounting-oriented measurement capability, indicator-based assessment focus, value-added evaluation emphasis, and revenue-oriented criterion implementation. Besides, the five consequences of IPMSS include sustainable organizational commitment, organizational citizenship behavior, continuous organizational loyalty, organizational competitiveness, and firm success. In addition, top management support, organizational learning dynamism, best management accounting system, information technology complementarity and competitive environment intensity are assumed to be the antecedent variables of the model in this research. Finally, accounting competency is the moderating role of the relationship between the antecedent variables and the five dimensions of IPMSS.

Research questions and objectives are created to link the relationships between all variables in this research together, of which IPMSS is the independent variable, and it is the suitable attribute to manage the firm's strategy. Especially, IPMSS is measured by five dimensions. All dimensions of IPMSS are hypothesized to be positively associated with sustainable organizational commitment, organizational citizenship behavior, continuous organizational loyalty, organizational competitiveness, and firm success. Within these relationships, firm success is determined as the main dependent variable which it is measured by the firm's ability to retain customers; and excellence in the innovation, operations, and finances of the firm over the long term.

Thai-listed firms are chosen as the population for this research because these firms represent at large businesses in Thailand, which have the sufficient resources and



higher capacity to implement the diverse performance measurement system to measure a firm's performance. Firms focus on performance evaluation system usage to increase the firm's higher capability and emphasize the use of various methods, such as BSC: Balanced Scorecard, Economic Value Added, Human Resource Scorecard, Accounting Measures, Key Performance Indicator, Activity-Based Costing and other indicators (Rompho, 2009). Large firms require complex process evaluation and several steps of more than small firms (Scott and Tiessen, 1999). These firms emphasize providing importance for human resources, and in perceiving that the employees are a key factor in creating the organization's success. These firms agree to pay higher compensation to their employees who have high ability to encourage and increase loyalty and commitment as well as to provide employees who participate in the ownership (SET, 2013). Thus, IPMSS is more likely to enhance the potential of human management under competitive environment intensity and to facilitate management to cause to increase the competitiveness and success of the firms. The population or sample size in this research is 696 Thai-listed firms which are selected from the database of the Stock Exchange of Thailand on its website (<http://www.set.or.th>), as of April 11, 2016.

### **Organization of the Dissertation**

This dissertation is divided into five chapters. Firstly, chapter one presents the introduction of this research, including the overview of the research, the purposes of the research, research questions, the scope of the research, and organization of the dissertation. Chapter two presents the relevant literature, theoretical foundations, the relationships between the variables, and develops the related hypotheses for testing. Chapter three explains the research methods, including the sample selection and the data collection procedure, the variable measurements, the instrumental verification, the statistics' equations to test the hypotheses, the table of definitions, and the operational variables of the constructs. Chapter four shows empirical results and the discussion. Finally, chapter five proposes the summary of results, the theoretical and managerial contributions, the limitations, and the future research directions.



## **CHAPTER II**

### **LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK**

The previous chapter provides an overview of the dissertation that consists of the issues and the importance of the integrated performance measurement system strategy, explaining the motivation to study about the integrated performance measurement system strategy that leads to the research objectives, research questions, and scope of the research. This chapter presents the literature review and conceptual framework of the dissertation. The chapter is divided into three sections. The first section provides the theoretical foundation, which is applied to explain and back up the relationships of all valuables. The second section explains the literature review and hypotheses development that are used to formalize the theoretical arguments on the associations of the constructs of the integrated performance measurement system strategy in the conceptual model, and the definitions of all constructs. The last section presents the summary of hypotheses relationships, and the integrated performance measurement system strategy description.

#### **Theoretical Foundations**

In order to provide a clearer understanding of the relationship of all constructs, the two main theories which are the resource-based view and contingency theory, are used to explain the relationships among the integrated performance measurement system strategy, its consequences, antecedents, and moderator. This research attempts to identify the main components of the integrated performance measurement system strategy (IPMSS) and to examine the relationships among IPMSS and its consequences, together with the relationships among IPMSS, its antecedents, and moderator variables. Moreover, the prior overview of the literature on the role of the antecedents and the consequences of IPMSS may be drawn, each of which is detailed as follows.



### Resource-Based View of the Firm

The resource-based view (RBV) refers to bundles of resources heterogeneously distributed across firms, and that resource differences persist over time (Barney, 1991; Russo and Fouts, 1997). The resource-based view of the firm provides the foundations for the assertion that competitive advantage depends on the firm's resources and capabilities, and also the firm's unique resource and capacities ultimately determine its strategy and performance (Barney, 1991; Eisenhardt and Martin, 2000). With regard to the resource-based view (RBV), firms attempt to exploit the valuable, heterogeneous, rare, and inimitable resources to develop and sustain competitive advantages through capabilities in the long term (Capron and Hulland, 1999; Henri, 2006; Russo and Fouts, 1997). Besides, resources comprise the various elements that can be used to implement value-creating strategies such as organizational assets, competencies-specific physical assets, and human resources (Henri, 2006).

The resource-based view (RBV) can separate the two different types of firm capabilities as being operational and dynamic capabilities (Zubac, Hubbard and Johnson, 2010). Firstly, operational capabilities refer to the firm's ability to combine, assemble and deploy the firm's assets using predetermined protocols, activities, routines, processes and systems to produce products and services which are sources of potential profits. Besides, the firm's operational capabilities are processes that consist of managerial, technical and marketing processes. Secondly, a firm's dynamic capabilities refers to the organizational processes concerning product development, strategic decision-making, and alliances. In addition, firm's dynamic capabilities also include integrative capabilities, architectural competencies, implicit/social or collective knowledge, combinative capabilities, managerial systems, values and norms, and invisible assets. It is developed to describe why any firms can perform better than their competitors despite the effects of significant environmental change.

The resource-based view of the firm is adopted to explain the impact of an integrated performance measurement system that can act as a strategy that increases organizational capabilities. Organizational capabilities are the processes by which companies acquire or develop their resources (Day, 1994). These capabilities are enhanced or created by the usability of the various integrated performance measurement systems for analysis and interactive purposes (Grafton, Lillis and Widener, 2010; Henri,



2006; Marginson, 2002; Mundy, 2010). Moreover, the use of IPMSS can facilitate strategic implementation and enhance organizational performance (Davis and Albright, 2004). It has an influence on the efficiency and effectiveness of performance through employees' attitudes and behaviors which are emphasized by the organization as well. Strategic performance measurement system is both a source of decision-facilitating information and a tool that spurs managers to choose additional relevant information (Burney and Widener, 2007). The firms which utilize both financial and non-financial performance measures are perceived to have procedural fairness, have positively associated with high organizational commitment, and also enhance an employee job performance (Lau and Moser, 2008). IPMSS can reduce an employee's ambiguity and conflict and also improve performance (Burney and Widener, 2007). Moreover, Itami (1987), Işık, Timuroğlu and Aliyev (2015) claim that teamwork, trust between manager and employees in the firm, and the ability to use and allocate resources can improve organizational goal achievement and competitive advantage in the long-term. Moreover, organizational commitment has a significant relationship with employee behavior, such as organizational citizenship behavior (Gautam et al., 2005), and organizational loyalty; subsequently enhancing organizational performance and firm success (Antoncic and Antoncic, 2011; Kataria, Garg and Rastog, 2013). In this research, the resource-based view (RBV) uses to describe the relationship between IPMSS and its consequence by providing the perspective of IPMSS as organizational capabilities to be likely to gain the greater sustainable organizational commitment, organizational citizenship behavior, continuous organizational loyalty, organizational competitiveness, and a firm's success. Thus, the resource-based view (RBV) is employed to back up the investigating of the relationships among integrated performance measurement system strategy and sustainable organizational commitment, organizational citizenship behavior, continuous organizational loyalty, organizational competitiveness and firm success.

### Contingency theory

The contingency theory hypothesizes that organizational structure is a function of context, a context that is simultaneously determined by both external and internal environments (Anderson and Lenen, 1999). Organizational structure refers to strategies that can increase the efficiency of the organization depend on the variable context of the



internal and external management of environmental factors within the organizational culture, technologies, and the size of the company; and with the most common internal factors that have been examined in relationship to management accounting (Chenhall, 2003; Chenhall and Morris, 1995). This theory is a classic in research organizations, which has been developed gradually since the 1950's. It is popular in the accounting research field, such as in management accounting, auditing, accounting information systems and managerial accounting (Cinquini and Tenucci, 2010). The contingency theory is presented completely from Fiedler (1967) who explained that there is no better way to organize a firm than to approach the management of the organization based on the situation or the environment. Therefore, organizational effectiveness is achieved by matching the organizational characteristics and its environment (Morton and Hu, 2008). Therefore, the contingency theory is concerned with the survival of the organization that fits with its environment.

The contingency theory of organizations is used to predict a relationship between an organization's characteristics (such as its performance measurement system) and organizational performance that depends on specific contingencies (Donaldson, 2001). The key foundation of this research is that the integrated performance measurement systems strategy cannot be universally appropriate. Each firm needs to design its own system according to its circumstances to avoid loss of performance. In the previous literature, this theoretical approach has been adopted to highlight specific contingencies that may affect IPMSS, such as strategic orientation or environmental uncertainty (Hoque, 2004; Ittner, Larcker and Randall, 2003). In relation to the appropriate use of the integrated performance measurement systems strategy and their effects, the contingency theory supports that the fit between contextual factors and the management control systems design is relevant to superior organizational performance (Chenhall, 2003; Ittner and Larcker, 1997; Lee and Yang, 2011; Luft and Shields, 2003). Moreover, Franco and Bourne (2003) support that the key factors that affect the successful implementation of IPMSS are organizational culture, leadership, top management support, learning and understanding the system, monitoring and improving system accuracy, process management, information technology support, and the environment of the business and industry. Correspondingly, Bastian and Muchlish (2012) have mentioned that environmental uncertainty, business strategy, and non-





financial performance measurement systems are significantly associated. Marc et al. (2010) confirm that the contextual factors (firm size, industry and knowledge about management tools) are the most important determinants to use and design the integrated performance measurement system strategy. Thus, integrated performance measurement system strategy is the way of the organizational management that firms have changed and designed according to their changed circumstances, environment, technologies and contextual factors for avoiding loss of their performance, and enhancing the successful implementation of this strategy.

This research determines competitive environment intensity and information technology complementarity to be two external environmental factors which play a significant role in determining the success of IPMSS. In addition, top management support, organizational learning dynamism, best management accounting system and accounting competency are internal factors which have an effect on IPMSS as well, based on the contingency theory. Furthermore, IPMSS that is the part of the effective organizational structure influences the firm's performance. Thus, the integrated performance measurement system strategy is affected by the suitable internal and external factors.

In conclusion, RBV is applied to explain the relationship between IPMSS and all its consequences (sustainable organizational commitment, organizational citizenship behavior, continuous organizational loyalty, organizational competitiveness and firm success). The contingency theory is applied to describe the relationship between the antecedents of IPMSS (top management support, organizational learning dynamism, best management accounting system, information technology complementarity and competitive environment intensity), its moderator (accounting competency) and the five dimensions of integrated performance measurement system strategy. Both theories illustrate the relationships between integrated performance measurement system strategy, its consequences, antecedents, and the moderator to be shown in Figure 1. The next section elaborates on the literature review, and the hypotheses of IPMSS that are discussed below.



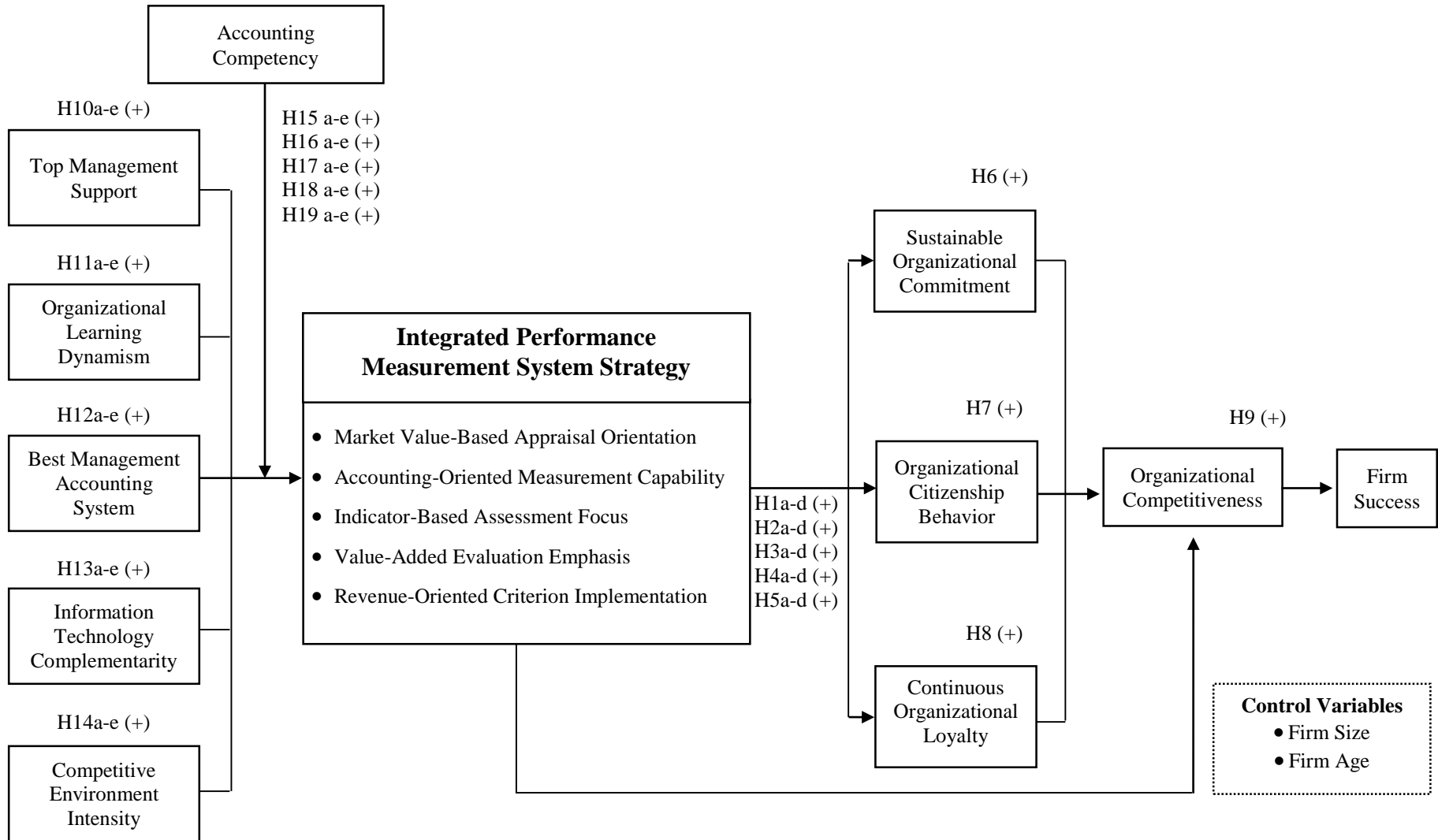
## Relevant Literature Review and Research Hypotheses

According to the theoretical framework, the probable relationships among several constructs are visible. This research proposes a conceptual model for empirically investigating the topic “Integrated Performance Measurement System Strategy and Firm Success: An Empirical Investigation of Thai-Listed Firms” as shown in Figure 1. This conceptual model determines that IPMSS is an independent variable, and firm success is a dependent variable respectively. Meanwhile, sustainable organizational commitment, organizational citizenship behavior, continuous organizational loyalty, and organizational competitiveness are the mediating effects in such a relationship. Moreover, there are five antecedents of IPMSS, including top management support, organizational learning dynamism, best management accounting system, information technology complementarity and competitive environment intensity. Lastly, accounting competency is the moderating variable that influences the relationship between the antecedents and five dimensions of IPMSS in this research.

This research proposes that IPMSS is positively associated with firm success. Sustainable organizational commitment, organizational citizenship behavior, continuous organizational loyalty, and organizational competitiveness act as IPMSS consequences. In addition, the antecedents of IPMSS are top management support, organizational learning dynamism, best management accounting system, information technology complementarity and competitive environment intensity which positively relate to each dimension of IPMSS. Finally, accounting competency is a moderator to assume that stronger accounting competency is associated with more positive relationships among each dimension of IPMSS and the antecedents variable. The full conceptual model of this research is presented in Figure 1.



Figure 1: A Conceptual Model of the Relationships between Integrated Performance Measurement System Strategy and Firm Success



## **Integrated Performance Measurement System Strategy (IPMSS) Background**

Since 1990, performance measurement has been received as an important topic for academics and many organizations (Gosselin, 2005). In general, performance measurement system is considered as the process of quantifying the efficiency and effectiveness of purposeful action and decision-making (Marc et al., 2010; Waggoner, Neely and Kennerley, 1999). Especially, the integrated performance measurement system strategy (IPMSS) is the firm's strategy to generate the sources of decision-facilitating information to be the instrument of managers for choosing leading additional relevant information to be useful (Burney and Widener, 2007; Melnyk et al., 2014). Ittner, Larcker and Randall (2003) state that the integrated performance measurement system strategy is simply the set of diverse measures that can provide information to enable firms to identify the strategies to offer the highest potential for achieving the firm's objectives, and also aligns management processes, including target setting, decision-making, and performance evaluation, together with the achievement of the chosen strategic objectives. It also provides the information to the managers to use for tracking organizational outcomes by comparing actual results against strategic goals and objectives (Simons, 2000). In addition, the strategic performance measurement system is a measurement and reporting system that quantifies the degree to which managers achieve the organizational strategic objectives (Verweire and Van den Berghe, 2004).

Integrated performance measurement system strategy (IPMSS) plays a major role to establish firm success, and it has a positive linkage with employee commitment and employee job satisfaction (Burney and Swanson, 2010). Firms have adopted such strategy in order to provide information and help the firm to identify that the strategies offer the highest potential for achieving the objectives and management process, including target setting, decision-making, performance evaluation, and compliance with the achievement of the selected strategic objectives and goals (Gates, 1999; Otley, 1999). In particular, when any firm has contemporary IPMSS, it will help them to translate business strategies into deliverable results by combining financial, strategic and operating business measures to estimate how well a company meets its targets (Giovannoni and Maraghini, 2013; Hall, 2008). Correspondingly, the integrated performance measurement system strategy plays an



important role in allocating responsibilities, decision rights, setting performance targets, tracking progress and rewarding outcomes (Merchant and Van der Stede, 2007).

The chosen sets of performance measures of performance measurement system strategy should be financial and/or non-financial, long and/or short-term, internal and/or external measures to support the right decision-making processes by way of gathering, processing, and analyzing quantified information about its performance and presenting it in the form of a brief overview (Aracıoğlu, Zalluhoğlu and Candemir, 2013; Bisbe and Malagueno, 2012; Gimbert, Bisbe and Mendoza, 2010). Likewise, Bourne et al. (2003) have given more details about the characteristics of IPMSS as such: 1) It is a set of multi-dimensional performance measures (both financial/non-financial measures, and internal/external measures) that quantify the performance which has been achieved and helps in forecasting the performance in the future. 2) It is relevant with respect to a reference framework against which the results of action can be judged. Besides, there is a consensus that the reference framework is the organization's strategy. 3) It is one part of a planning and control system to influence the behavior of individuals and groups within the firm. 4) It is not only concerned with measuring the firm's performance as to efficiency and effectiveness of its actions; but also measures the impact of its actions on its stakeholders. According to Caplice and Sheffi (1995) describe six features of IPMSS, including: 1) a comprehensive means that should capture all constituencies and stakeholders of the process, 2) a causally-oriented means that can track activities and indicators which influence future and current performance, 3) a vertically-integrated means that can translate overall strategy of the firm to all decision makers of the organization, 4) a horizontally-integrated means that can include pertinent activities, function, and departments along the process, 5) an internally-comparable means that can recognize and allow for tradeoffs between the different dimensions of performance, and 6) a useful means which is readily understandable by the decision makers and provides a guideline. Therefore, the integrated performance measurement system strategy is the system base of multi-dimensional performance measures as a result of linking organization strategy with the purpose to implement the strategy, to evaluate business performance, provide performance feedback outcome, support the right decision-making, and ensure communication (Khan and Shah, 2011).



The performance measurement has been used for the first time since the late thirteenth century, when double-entry accounting was applied to settle transactions among traders (Johnson, 1981; Zairi, 1996). It was developed as three stages, including a first recommendation, framework, and performance measurement system (Folan and Browne, 2005). The recommendations are the part of advice on the measures or structure of performance measurement, while the frameworks are the active employment of specific sets of recommendations, clarifying boundaries and specifying dimensions of a performance measurement. Lastly, a performance measurement system is the system implemented by a firm, whereas a developed performance measurement framework refers to a general theoretical framework developed in research that can act as the basis for a performance measurement system (Bassioni, Price and Hassan, 2004).

Besides, the evolution of performance measurement can also be described, as two-phase. The first phases started in the late 1880s to the early 1980s, and the second phase started in the late 1980s (Ghalayini and Nobles, 1996; Gomes, Yasin and Lisboa, 2004). The first phase performance measurement began as a result of the industrial revolution in Europe and America (Williams and Seaman, 2002). Many firms focused on cost accounting orientation to measure a firm's performance (Kurien and Qureshi, 2011). The techniques are used for estimating the performance of the organization in this phase; for example, cost variance analysis, standard costing, and flexible budgets (Bourne et al., 2003). The key factors are a cause of the development of the performance measures of cost accounting, namely the change from piecework payments to the wage system, brought techniques that helped define the cost of production and the motivation for the works of employees (Johnson, 1981). Internal control systems were generated to manage firms that had multi-operational production systems to track day-to-day operations, and to compare production and cost among the different divisions and departments (Johnson, 1978). Therefore, during this time, firms emphasized scientific management methods and internal administrative processes for implementing management control (Khan and Shah, 2011).

During the 1940s and 1950s, in the same phase, productivity concepts emerged in the manufacturing organizations, leading to more emphasis on financial measures such as sales, production, efficiency, return on investment and other ratios (Bititci et al., 2009). Financial measures became for the most part, to be used for developing cost accounting



systems and control systems of organizational management (Johnson and Kaplan, 1987; Keegan et al., 1989; Parida, 2006).

After 1980, the change of competitive environment and the fluctuation of the global economy stimulated the market to provide to become the competitive field; thus, customers have the higher and different demand. The performance measurement shifted from productivity concepts to be quality, time, cost, flexibility and customer satisfaction orientation (Hayes and Abernathy, 1980; Kaplan, 1984). In the period, academics had begun to see the deficiencies of the traditional financial measures in performance measurement systems, and they criticized financial measures that were inappropriate for measuring the firm's overall performance. It is still criticized for the following reasons: firstly, financial measures present a one-sided view of organizational activities, making effective coordination difficult. Secondly, financial measures lack strategic focus and fail to provide data on quality, responsiveness, and flexibility. Thirdly, they encourage managers to minimize the variances from the standard to be more than continually seeking to improve. Fourthly, financial measures fail to provide information on what customers want and how competitors are performing. Finally, financial measures are historically focused (Johnson and Kaplan, 1987; Kaplan and Norton, 1992). Moreover, traditional financial measures still are criticized as being historical in nature and lagging indicators of performance oriented to the short-term and ignoring an organization's strategy (Khan and Shah, 2011). Especially, Johnson and Kaplan (1987) are the first groups that have suggested the firms should shift from the cost accounting orientation to a more integrated performance measurement system.

Defects and weaknesses of the traditional measure of the firm's performance measurement system are the cause of a performance measurement crisis lead to the revolution in the existing performance measurement system (Eccles, 1991; Neely, 1998). The comparison of traditional against non-traditional performance measures by Ghalayini and Noble (1996) can conclude that the non-traditional performance measure should be based on company strategy; mainly, non-financial measures intended for all employees, have on-time metrics (hourly, or daily), that are simple, accurate and easy to use, lead to employee satisfaction, frequently used on the shop floor, have no fixed format (depends on needs), vary between locations, change over, intend to improve performance, and help in achieving continuous improvement.



The emergence of balanced performance measurement frameworks started the second phase of performance measurement evolution. The term “balanced” is defined by Kaplan and Norton (1996) as using measures that provide a holistic view of the organization. During this phase, non-financial measures began to be necessary for monitoring performance and motivating employees for the reason that it can provide performance outcomes to be timely, measurable, precise, meaningful, and flexibility, together with to help and improve the operational processes consistent with the firm’s goal and strategies (Medori and Steeple, 2000).

Throughout the 1990s to the present, integrated performance measurement frameworks have been continuously designed and developed to provide firms with the ability to bring such frameworks for applying to appropriately create the performance measurement system strategy with the context of each organization. The performance measurement matrix is the first system that is accepted as a balanced or integrated frame to measure business performance by Keegan, Eiler and Jones (1989). Then, frameworks have been presented and popularized to apply with many firms such as Performance Measurement Questionnaire by Dixon, Nanni and Vollmann, (1990), Results and Determinants Framework by Fitzgerald et al. (1991), Strategic Measurement and Reporting Technique Pyramid (SMART) by Lynch and Cross (1991), Balanced Scorecard by Kaplan and Norton (1996), and Performance Prism by Neely, Adams and Crowe (2001). Moreover, several frameworks focus on information related to the multiple dimensions of the various internal and external drives, and the non-financial and financial results for an overview such as that by Tangen (2004), Abran and Buglione (2003), Horváth and Seiter (2009), and the Multi-Criteria Performance Measurement Model (Kasie and Belay, 2013).

The current issues of performance measurement system are undergoing considerable changes which have resulted in a shift towards a more integrated approach. There remain issues in performance measurement systems that have hindered firms to exploit their full potential. IPMSS has been developed continuously under the assumption that it should be derived from its strategy. Neely, Adams and Crowe (2001) argue that the performance measure in IPMSS should be created from the stakeholder’s needs and satisfactions more than the firm’s strategy. Besides, Tangen (2004) further supports that contemporary integrated performance measurement system strategy should be derived from the firm’s strategic objectives, have an appropriate balance, have a limited number of





performance measures to reduce the risk of information overload, be easily accessible, and comprise the performance measures that have understandable specifications. As a result, firms should design a new IPMSS that emphasizes compliance with firm strategy and their stakeholder perspective by using financial and non-financial measures, intended for all employees, have on-time metrics (hourly, daily), that are simple, accurate, easy to use, lead to employee satisfaction, have no fixed format, differ about locations, change over time as the need changes, intend to improve performance, and help in achieving continuous improvement (Gosselin, 2005).

This research provides the definition of integrated performance measurement system strategy (IPMSS) by emphasizing the firm's strategic ability and implementation from the strategic managers' points of view. Also, the activities at this level have made it possible for the firm to achieve long-term goals, create a competitive advantage, and focus on organizational behavior. Therefore, IPMSS explains the reason why some firms have organizational behavior, competitive advantage, and success than other firms. The definition of IPMSS is shown in Table 1.

Table 1: The Definition of Integrated Performance Measurement System Strategy

Author(s)	Definition
Neely, Gregory and Platts (1995)	Performance measurement system refers to the set of metrics used to quantify both the efficiency and effectiveness of actions.
Kaplan and Norton (1996)	Performance measurement system (balanced scorecard) refers to a comprehensive set of performance measures from four different measurement perspectives (financial, customer, internal, and learning and growth) that provide a framework to translate the business strategy into operational terms.
Simons (2000)	Performance measurement system refers to an information system that manager use to track the implementation of business strategy by comparing actual results against goals and objectives.



Table 1: The Definition of Integrated Performance Measurement System  
Strategy (continued)

Author(s)	Definition
Maisel (2001)	Performance measurement system refers to a system that enables an organization to manage its performance and ensures that all the functions and activities are in line with the strategy to achieve the business results and create shareholder value.
Ittner, Larcker and Randall (2003)	Strategic performance measurement system refers to simply a set of diverse measures that can provide information which it assists the firm to identify the strategies offering the highest potential for achieving the firm's objectives, and aligns management processes, such as target setting, decision-making, and performance evaluation, with the achievement of the chosen strategic objectives.
Henri (2006)	Measurement diversity refers to the extent to which top management teams measure and use information related to a broad set of measures, which emphasizes the multiplicity and variety of performance that can be grouped into financial and non-financial performance.
Hall (2008)	Performance measurement system refers to a system that translates business strategies into deliverable results why combining financial, strategic and operating business measures to gauge how well a firm meets its targets.
Giovannoni and Maraghini (2013)	Integrated performance measurement system refers to the comprehensiveness of the measures which have to reflect all the relevant features of a firm's performance and value creation their consistency with each other and according to the firm's strategy.



Table 1: The Definition of Integrated Performance Measurement System Strategy (continued)

Author(s)	Definition
Melnik et al. (2014)	Performance measure refers to the tool used to measure the efficiency and effectiveness of work, thus, a performance measure is both quantifiable and verifiable.

In summary, “integrated performance measurement system strategy” in this research refers to the firm's capabilities to apply the diverse methods and metrics for tracking the overall organizational performance, monitoring the progress related to strategic objectives and action plans, allocating responsibilities, supporting the right decision-making, setting performance targets and rewarding outcomes (Kasie and Belay, 2013; Merchant and Van der Stede, 2007; Neely, Gregory and Platts, 2005). Particularly, the five dimensions of integrated performance measurement system strategy have been adapted from Kasie and Belay (2013) who have incorporated all crucial stakeholder perspectives of the Performance Prism (Neely, Adams and Crowe, 2001) and Balanced Scorecard (BSC) together in order to cease the revolution of defects and weaknesses in traditional performance measurement systems. It is a combination of four perspectives in BSC (Kaplan and Norton, 1992) and the perspectives of society, environment, employees, market, and supplier partnerships in the Performance Prism (Neely, Adams and Crowe, 2001). Moreover, this research also has added to the perspective of using a set of diverse measures which include financial and non-financial measures, long and short-term measures, and internal and external measures (Ittner, Larcker and Randall, 2003). In other words, the performance objective of increasing market efficiency is added to the first dimension, the performance perspective of cost accounting and measures is added to the second dimension, and other performance measures are added to every dimension for providing concord with the complex environment and dynamic business conditions at the present moment. It also captures a complete picture of a firm's overall performance, allocates responsibilities, supports decisions, sets performance targets, tracks progress, and rewarding outcomes (Merchant and Van der Stede, 2007).



Therefore, IPMSS consists of five new dimensions as being: 1) market value-based appraisal orientation; 2) accounting-oriented measurement capability; 3) indicator -based assessment focus; 4) value-added evaluation emphasis and 5) revenue-oriented criterion implementation. The details of each dimension of IPMSS can be clearly summarized as an overall perspective as which includes performance perspectives, objectives and measures of each dimension as presented in Table 2. Also, a summary of the key literature review on IPMSS is presented in Table 3, respectively.

Table 2: Summary of Integrated Performance Measurement System Strategy Sheet

Dimensions	Performance perspectives	Performance objectives	Performance measures
Market Value- Based Appraisal Orientation (MBAO)	Customers and market	Expansion of market share	Market share growth
		Increasing customer satisfaction	Satisfied customers Retained customers New customers added
		Increasing marketing efficiency	Market activity costs
Accounting- Oriented Measurement Capability (AOMC)	Financial accounting	Increasing profitability efficiency, and financial condition	Profit margin Return on assets (ROA) Cash flows A/C receivable turnover Return on capital employed
	Cost accounting	Budget utilization/ Operating costs	Labour costs Cost relative to competitors Cost of quality Overhead cost Total manufacturing cost



Table 2: Summary of Integrated Performance Measurement System Strategy  
Sheet (continued)

Dimensions	Performance perspectives	Performance objectives	Performance measures
			Service cost/warranty Scrap cost Material costs Distribution cost Cost of goods sold/sales Running cost per unit Value added cost per unit
Indicator-Based Assessment Focus (IBSF)	Operation/ Process	Improving delivery time	Orders delivered on time
		Enhancing product and service quality	Failure cost
		Enhancing process efficiency	process efficiency
		Reducing product cycle times	Product cycle times
	Community	Increasing community satisfaction	Community complaints
		Reducing pollution	Scrapes and wastages reduced
	Supplier	Improving material quality	Defect rate
		Decreasing lead time	Lead time
		Improving raw material costs	Raw material costs



Table 2: Summary of Integrated Performance Measurement System Strategy  
Sheet (continued)

Dimensions	Performance perspectives	Performance objectives	Performance measures
Value-Added Evaluation Emphasis (VAEE)	Employee	Enhancing employee satisfaction	Satisfied employees
		Reducing accidents	Accident frequency rate
		Reduction of employee turnover	Employee turnover
	Training and Development	Improving employee productivity	Output/employee
		Enhancing R & D	Innovations
		Enhancing training and education	Employee skill level Qualification growth
Revenue-Oriented Criterion Implementation (ROCI)	Sales	Increasing revenue	Sale revenue Sales growth Sales by product



Table 3: Summary of Key Literature Reviews on Integrated Performance Measurement System Strategy

Author(s)	Titles	Independent Variables	Dependent Variables	Results
Franco and Bourne (2003)	Factors that play a role in managing through measures	- Organizational culture, Management leadership and commitment, Compensation link to the strategic performance measurement system, Education and understanding, Communication and reporting, Review and update, Information technology support, Business and industry and Performance measurement system framework	Performance measure	The results indicate that both 9 factors have a greater impact on the way organizations manage through performance measures.
Schneider et al. (2003)	Which comes first: employee attitudes or organizational financial and market performance?	- Financial measures - Return on assets (ROA) - Earnings per share (EPS)	Employee behavior	The results find that financial measures have a positive impact on job satisfaction and satisfaction with security.

Table 3: Summary of Key Literature Reviews on Integrated Performance Measurement System Strategy  
(continued)

Author(s)	Titles	Independent Variables	Dependent Variables	Results
Henri (2006)	Organizational culture and performance measurement systems	- Environmental uncertainty	- Diversity of performance measurement	The results find that there is the positive relationship between environmental uncertainty and diversity of measurement.
Van der Stede, Chow and Lin (2006)	Strategy, choice of performance measures, and performance	- Financial measures - Objective non-financial measures, such as internal operating, employee oriented, customer-oriented - Subjective measures	- Firm Performance	The result finds that performance measurement diversity benefits performance. Especially, the firm that has included the objective and subjective, non-financial measures in the performance measurement systems has higher performance.



Table 3: Summary of Key Literature Reviews on Integrated Performance Measurement System Strategy  
(continued)

Author(s)	Titles	Independent Variables	Dependent Variables	Results
Burney and Widener (2007)	Strategic performance measurement systems (PMS), job-relevant information, and managerial behavioral responses	- Strategic performance measurement systems	- Job-relevant information -Role ambiguity -Role conflict -Managerial performance	The result finds that strategic PMS has a positive impact on performance through its relations with job-relevant information and role ambiguity. The authors further explain that managers recognize that they have higher levels of job-relevant information, lower levels of role ambiguity and role conflict when strategic performance measurement systems closely linked to strategic goals. Performance is higher when their role ambiguity is lower.
Hall (2008)	The effect of comprehensive performance measurement systems on role clarity, psychological empowerment, and managerial performance	- Comprehensive performance measurement systems	- Role clarity - Psychological empowerment - Managerial performance	The results indicate that a comprehensiveness of performance measurement system influences on managers' cognition and motivation, which, in turn, influences on managerial performance as well.

Table 3: Summary of Key Literature Reviews on Integrated Performance Measurement System Strategy  
(continued)

Author(s)	Titles	Independent Variables	Dependent Variables	Results
Lau and Moser (2008)	Examining the relationship between nonfinancial performance measure and employee behavioral outcomes	- Non-financial performance measures usage	- Organizational commitment - Managerial performance	The result of this study indicates non-financial performance measures are positively related to organizational commitment.
Fleming, Chow and Chen (2009)	Strategy, performance measurement systems, and performance: A study of Chinese firms	Use of integrated performance measurement system	-Firm performance	The results of this study find that greater use of balanced/integrated performance measurement system by Chinese firms increases their firm performance.
Rompho (2009)	Factors affecting the success of performance measurement system	- Information technology support - Learning and growth	- Performance measurement system success	The result shows that information technology support, and learning and growth have a positive effect on the success of performance measurement system in the long-time.

Table 3: Summary of Key Literature Reviews on Integrated Performance Measurement System Strategy  
(continued)

Author(s)	Titles	Independent Variables	Dependent Variables	Results
Johnson, Davis and Albright (2009)	Firm's performance and employee attitudes	- Firm financial performance	Employee attitudes - Job satisfaction - Pay satisfaction - Organizational commitment - Organizational justice	The result of this study indicates that firm's performance has a positive impact on employee attitudes. Besides, financial performance causes employee's positive attitudes when financial performance improves.
O'Sullivan, Abela and Hutchinson (2009)	Marketing performance measurement and firm performance	- Market performance measurement ability	- Firm performance	The firm's ability of marketing performance measurement positively affects higher firm performance and CEO satisfaction.

Table 3: Summary of Key Literature Reviews on Integrated Performance Measurement System Strategy  
(continued)

Author(s)	Titles	Independent Variables	Dependent Variables	Results
Burney, Henle and Widener (2009)	The relations among strategic performance measurement system characteristics, justice, and extra- and in-role performance	-Strategic performance measurement system (PMS) (i.e. Multiple financial and non-financial measures)	- Organizational citizenship behaviors (OCB)	The result finds that strategic performance measurement system when is combined with compensation contract and it directs employees' attention. It can motivate their employees' behavior to be consistent with organizational goals. Strategic performance measurement system positively affects employees' OCB through the procedural justice.
Burney and Swanson (2010)	The relationship between balanced scorecard characteristics and managers' job satisfaction	- Balanced scorecard - Customer measures - Internal business process measures - Learning and growth measure - Strategy link	- Job satisfaction	The result confirms a positive relationship between the ability of the firm to links performance measures to organizational strategy and job satisfaction of their managers.

Table 3: Summary of Key Literature Reviews on Integrated Performance Measurement System Strategy  
(continued)

Author(s)	Titles	Independent Variables	Dependent Variables	Results
Dossi and Patelli (2010)	You learn from what you measure: financial and non-financial, performance measures in multinational companies	-Non-financial indicators - Customer indicators - Internal processes indicators - People indicators	-Relative performance evaluation	The results show that non-financial indicators contain in PMS refer equally to customers, internal processes and people measurement perspectives and also find that the inclusion of four indicators is positively associated with performance evaluation.
Marc et al. (2010)	Determinants of integrated performance measurement systems usage	- Contextual factors - Business objectives - Knowledge	- Integrated performance measurement systems usage	The results confirm that contextual factors such as firm size, industry, and knowledge about management tools and method are the most important determinants of integrated performance measurement systems usage.
Xiao-le, Hong-Jun and Potter (2010)	Interrelationship between uncertainty and performance	External uncertainties - Legislation - Customer behavior - Channel relationship	-Economic performance -Customer satisfaction - Environmental performance	The results show that uncertainty in channel relationships and legislation has an impact on economic and environmental performance.

Table 3: Summary of Key Literature Reviews on Integrated Performance Measurement System Strategy  
(continued)

Author(s)	Titles	Independent Variables	Dependent Variables	Results
Karimi, Malik and Hussain (2011)	Investigative the relationship of performance appraisal system and employee satisfaction	-Performance appraisal system	-Employee satisfaction	The result indicates that there is a positive relationship between employee performance evaluation system and employee satisfaction. Moreover, the result finds that the enhancement of organization performance depend on employee satisfaction and is considered as the main factor to affect organizational success.
Lee and Yang (2011)	Organization structure, competition and performance measurement systems and their joint effects on performance.	- Organization structure - Competition	-Performance measurement systems	The results indicate that organization structure is significantly associated with the design of performance measurement system. The findings also partly support the presence of joint effects on a performance linking organization structure, competition, and the use of performance measurement systems. When there is greater competition among firms, the relationship between the stages of the developing of performance measurement system and firm performance is positive.
		- Performance measurement systems	-Organizational performance	

Table 3: Summary of Key Literature Reviews on Integrated Performance Measurement System Strategy  
(continued)

Author(s)	Titles	Independent Variables	Dependent Variables	Results
Bastian and Muchlish (2012)	Perceived environment uncertainty, business strategy, PMS and organizational performance	-Environment uncertainty, -Business Strategy	-Performance measurement systems	The result of this study is perceived environment uncertainty, business strategy and non-financial performance measurement system significantly associated.
Bisbe and Malagueño (2012)	Using strategic performance measurement systems for strategy formulation	-Strategic performance measurement systems	-Organisational performance	The result finds evidence supporting a positive association between strategic performance measurement systems and firm performance that is mediated by a comprehensiveness of the strategic decision arrays.
Rompho and Siengthai (2012)	Integrated performance measurement system for firm's human capital building	- Effective performance measurement system	-Employee satisfaction -Work-related competencies	The results find that the effective performance measurement system which consists of valid individual performance measure, a comprehensive set of performance measure and coherent PMS with its environment is positively related to employee satisfaction and work-related competencies.

Table 3: Summary of Key Literature Reviews on Integrated Performance Measurement System Strategy  
(continued)

Author(s)	Titles	Independent Variables	Dependent Variables	Results
Ahmed, Khushi and Islam (2013)	The relationship between perceived fairness in performance appraisal and organization citizenship behavior: the mediating role of organizational commitment	- Perceived fairness in performance appraisal	- Organizational commitment - Organizational citizenship behavior	The result indicates that there is the positive relationship between perceived fairness in performance appraisal and organizational citizenship behavior through organizational commitment mediates this relationship.
Kasie and Belay (2013)	The impact of multi-criteria performance measurement on business performance improvement	Multi-criteria performance measurement -Finance -Customer and market -Process/operation -Employee satisfaction -Training & development -Social & environmental -Supplier partnership	- Business performance improvement	The result indicates that firms which measure their performance by using important financial and non-financial measures (i.e. customer and market measure, process/operation measure, employee satisfaction, training and development, social and environmental measure, and supplier partnership achieve better firm performance.



Table 3: Summary of Key Literature Reviews on Integrated Performance Measurement System Strategy  
(continued)

Author(s)	Titles	Independent Variables	Dependent Variables	Results
Tätilä, Helkiö and Holmström (2014)	Exploring the performance effects of performance measurement system use in the maintenance process	- Deployment of performance measurement system -Use of performance measurement system	Behaviour - Improve competitiveness - Motivation - Goal communication	The result shows that the deployment of performance measurement system has a positive effect on the improvement of competitiveness, and goal communication. The use of performance measurement system for personal level motivational and improvement practices is positively related to motivation.
		Behaviour - Improve competitiveness - Motivation - Goal communication	Performance -Efficiency -Dedication -Extra work	The result shows that motivation, and willingness to improve competitiveness are positively related to organizational efficiency and motivation is positively related to firm performance.

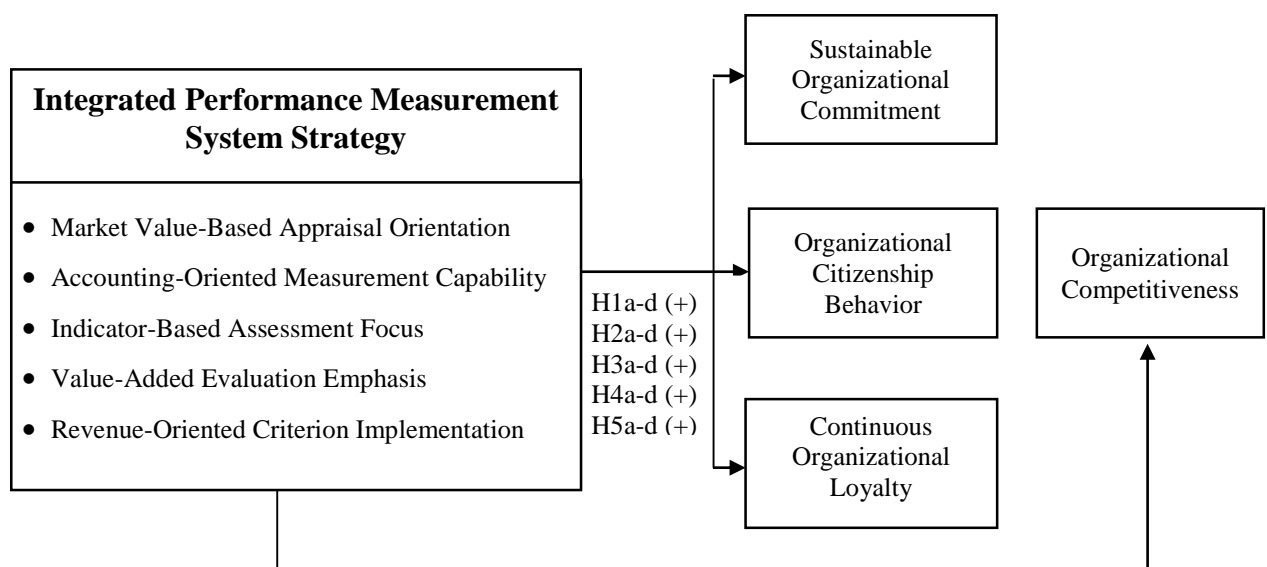
Table 3: Summary of Key Literature Reviews on Integrated Performance Measurement System Strategy  
(continued)

Author(s)	Titles	Independent Variables	Dependent Variables	Results
Bhatti, Awan and Razaq (2014)	The key performance indicators (KPIs) and their impact on overall organizational performance	Key performance indicators -cost, financial, -quality, -time, -flexibility performance, -delivery reliability, -safety, - customer satisfaction, -employees satisfaction, -social, learning and growth	-Overall organizational performance	The result shows that the manufacturing organizations put more focus on the customer satisfaction and delivery reliability in terms of performance measurement. And measuring the performance in terms of cost, financial, quality, time, flexibility, delivery reliability, safety, customer satisfaction, employees' satisfaction and social performance indicators have a significant positive impact firm performance.
Waitip, Janjarasjit and Raksong (2015)	Performance evaluation system competency and firm survival	-Organizational commitment awareness - Organizational citizenship behavior (OCB) -Organizational loyalty concern	-Corporate competitiveness	The result shows that there is a positive relationship between the organizational loyalty concern and corporate competitiveness.

## Integrated Performance Measurement System Strategy and Its Consequences

This section focuses on the effects of the five dimensions of integrated performance measurement system strategy, including market value-based appraisal orientation, accounting-oriented measurement capability, indicator-based assessment focus, value-added evaluation emphasis, and revenue-oriented criterion implementation, all show in Figure 2.

Figure 2: The Effects of Integrated Performance Measurement System Strategy on Sustainable Organizational Commitment, Organizational Citizenship Behavior, Continuous Organizational Loyalty and Organizational Competitiveness



### Market Value-Based Appraisal Orientation

Measuring the performance of market and customers of the organizations has long been a critical issue in marketing and accounting literature (Frösén et al., 2013; Lamberti and Noci, 2010; O’Sullivan, Abela and Hutchinson, 2009) and remain a key issue for many firms (Fellman, 1998). The change of competitive environment and the fluctuations of the global economy cause markets to become an intensely competitive field, and the demands of customers are not stable (Khan and Shah, 2011). Thus, the measurement of market performance and customer satisfaction began to receive the



attention from firms and were increasingly used for measuring the performance measurement (Bhatti, Awan and Razaq, 2014; Kasie and Belay, 2013; O'Sullivan, Abela and Hutchinson, 2009). Then, the market value-based appraisal orientation in IPMSS became the measurement frame to control and track organizational processes and performance periodically to incorporate the formalized routines and procedures by using information to maintain or alter goal-oriented patterns in organizational activity (Morgan, Clark and Gooner, 2002). It has the important role in the firm's operation according to Lamberti and Noci (2010) who have suggested that many firms utilize the market value-based appraisal to: 1) review whether the intended strategy has been implemented; 2) communicate to their employees what are the goals that they expect to achieve, and whether they are achieving those expected goals or not; 3) validate whether the intended strategies are still valid; and 4) facilitate and improve individual and organizational learning. Moreover, market-value based appraisal orientation can provide feedback outcomes regarding marketing efforts (Clark, Abela and Ambler, 2006) and input data for planning and decision-making in the present and future (Morgan, Clark and Gooner, 2002). Whenever the perspective of customer and market is utilized to measure performance, the information can reflect how to create the market value of the firms through its strategy and actions (Ahmed et al., 2011).

Market value is the key word of this variable. Woodruff (1997) indicates that the perceived value is the comparison between the services that customers receive and the overall quality received or the comparison between the overall qualities versus the price to pay. Moreover, market value can be created through the perceived value of customers based on their judgment of trade-offs between "what they get" (perceived benefits, quality, or performance) and "what they give". Values through the eyes of customers are various, including product utility (Zeithaml, 1988), perceived benefits over the costs (Christopher, 1996), market-perceived quality adjusted for relative prices (Grale, 1994), and perceived benefits over sacrifices (Eggert and Ulaga, 2002). The perceived value is a key factor affecting customer satisfaction. When customer satisfaction is high, it can increase financial performance through enhancing the loyalty of existing customers, reducing price elasticity, lowering marketing costs through positive word-of-mouth advertising, reducing transaction costs, and enhancing organization reputation (Ittner and Larcker, 1998; Neely, Gregory and Platts 2005).



Therefore, market value-based appraisal orientation in this research refers to the firm's ability to measure the market and customer performance by using a set of several market metrics for tracking marketing efficiency, expansion of market share and customer satisfaction, and providing feedback regarding the outcomes of marketing efforts (Ahmed et al., 2011; Clark, Abela and Ambler, 2006; Kasie and Belay, 2013; Lamberti and Noci, 2010). Especially, the set of market metrics consist of: 1) market share growth measures the expansion of market share, 2) customer satisfaction, retained customers, and new customers measure the increase of customer satisfaction (Kaplan and Norton, 1992; O'Sullivan, Abela and Hutchinson, 2009; Rust, Zeithaml and Lemon 2004), and 3) the immediately cost and turnover from promotion, selling, pricing, and distribution activities is the performance measures of increasing market efficiency (Morgan, Clark and Gooner 2002). All measures are recognized as the key market metrics about the perspective of the market and customer performance measurement (Bhatti, Awan and Razaq, 2014; Kasie and Belay, 2013; Lamberti and Noci, 2010). In addition, marketing efficiency is the abilities to transform the marketing efficient inputs into marketing outputs (Ambler, 2003; O'Sullivan and Abela, 2007).

Market value-based appraisal orientation is the first dimension of IPMSS to focus on the performance measurement of the expansion of market share, increasing customer satisfaction, and marketing efficiency (Kasie and Belay, 2013; Neely, Adams and Crowe, 2001; Kaplan and Norton, 1992). The previous literature review on market value-based appraisal orientation and firm outcomes are as follows. O'Sullivan, Abela and Hutchinson (2009) find that marketing performance measurement positively affects firm performance and CEO satisfaction. Van der Stede, Chow and Lin (2006) find that the firm's performance measurement diversity emphasizes the use of objective non-financial measures (i.e. customer-oriented) which influence higher firm performance. Moreover, Burney and Swanson (2010) support the positive relationship between customer measures in the balanced scorecard (BSC) characteristics, and the managers' job satisfaction. Kasie and Belay (2013) find that the firms which use the performance measurement of customers and markets gain better business performance. It is consistent with Bhatti, Awan and Razaq (2014) who find that in the manufacturing organizations, the performance measurement which focuses on the terms of customer satisfaction and delivery reliability have a significant, positive impact on overall



performance. Correspondingly, Clark and Ambler (2001) state that marketing and customer performance measurement has a positive relationship with marketing activities and firm performance. Besides, marketing performance measurement improves decision-making and firm performance (Morgan, Clark and Gooner 2002). Furthermore, it helps facilitate strategy implementation and enhance organizational performance (Davis and Albright, 2004). It also has an influence on the efficiency and effectiveness of performance through employees' attitudes and behavior which is emphasized by the organization. The organization uses both financial and non-financial measures which are perceived as procedural fairness and is associated with higher of organizational commitment, and their employees' job performance (Lau and Moser, 2008). Acceptance of organizational goals and a willingness to exert effort on the organization's behalf is a characteristic of strong organizational commitment (Angle and Perry, 1981; Bridges and Harrison, 2003; Colbert and Kwon, 2000). Meanwhile, Rompho and Siengthai (2012) indicate that the effective performance measurement system consists of: 1) valid individual performance measures, 2) a comprehensive a set of performance measures, and 3) coherent performance measurement systems with its environment that is positively related to employees' satisfaction of the firm and work-related competencies. Furthermore, Burney, Henle and Widener (2009) find that IPMSS (i.e. multiple financial and non-financial measures) is linked to the compensation contract influence of employees' attention, and motivates their work behaviors to be aligned with organizational goals. Also, IPMSS positively affects employees' organizational citizenship behaviors through procedural justice. In summary, market value-based appraisal orientation is likely to gain greater sustainable organizational commitment, organizational citizenship behavior, continuous organizational loyalty and organizational competitiveness. Therefore, the hypotheses are proposed as follows:

***Hypothesis 1a: The higher the market value-based appraisal orientation is, the more likely that a firm will gain greater sustainable organizational commitment.***

***Hypothesis 1b: The higher the market value-based appraisal orientation is, the more likely that a firm will gain greater organizational citizenship behavior.***



***Hypothesis 1c: The higher the market value-based appraisal orientation is, the more likely that a firm will gain greater continuous organizational loyalty.***

***Hypothesis 1d: The higher the market value-based appraisal orientation is, the more likely that a firm will gain greater organizational competitiveness.***

#### Accounting-Oriented Measurement Capability

Financial and cost accounting performance measurement began as a result of the industrial revolution in Europe and America in the first phase during the 1880s to the 1980s (Khan and Shah, 2011; Williams and Seaman, 2002). Mainly, manufacturing organizations focus on the cost accounting orientation of the performance measurement system (Kurien and Qureshi, 2011). When productivity concepts emerged, financial indicators such as sales, production, efficiency, return on investment (ROI) and other financial ratios (Bititci et al., 2009) were the main measures used for developing cost and management control systems (Keegan et al., 1989; Kurien and Qureshi, 2011). Financial performance measures are the best measures to evaluate the company's performance, such as the physical values of sales and profits or return on equity and assets (Bhatti, Awan and Razaq, 2014). The financial perspective focuses on the interest of shareholders and shows the link between strategic objectives and financial impacts (Ahmed et al., 2011).

Accounting-oriented measurement capability is the second dimension of IPMSS which emphasizes measuring a firm's overall financial conditions, profitability, efficiency, operational costs and related other ratios by using a diverse set of financial and cost accounting metrics, because the financial and cost accounting measures have been popular with executives of the firms. For success in the current dynamic business environment, the performance measurement system of each firm should combine financial and non-financial measures together to capture a complete picture of overall organizational performance and should monitor whether the customers' needs are met and have kept the organization's costs under control. There are several studies to identify that financial measures are important and are often used. For example, Swamy (2002) identifies that the key financial measures which are used in measuring of performance include accounting earnings, earnings per share (EPS), residual income,



economic value added (EVA), joined budgets, return on investment (ROI), operating profits, activity-based costing (ABC), net present value (NPV), and cash flows. Meanwhile, Hofer, Eisl and Mayr (2012) state that return on sales (ROS), return on assets (ROA), and return on capital employed (ROCE) are mostly used to measure the performance of internet firms. Mainly, Taticchi, Tonelli and Cagnazzo, (2010) assert that return on investment (ROI), return on equity (ROE), return on capital employed (ROCE) and Economic Value Added (EVA) are the main parts of performance measurement system. Besides, net profit (NP), Tobin's Q, Economic Value Added (EVA), residual income, and other financial ratios are often generally used as the financial performance measures (Marc et al., 2010; Simons, 2000; Stewart, 2007; Wallace, 1997). From a changed organizational environment where ownership and management were separated, financial measures are applied by owners for the purpose of monitoring the performance of managers and employees (Kennerley and Neely, 2003). Thus, this research has selected the set of accounting and financial metrics including net profit, return on assets, cash flows, and other financial ratios to measure the overall financial condition, profitability, efficiency, investment and financial activities, and other related factors (Kasie and Belay, 2013).

For cost-based measures of IPMSS, organizations use cost accounting system to measure efficiency and effectiveness, together with representatives to relate internal performance measures to external ones (White, 1996). Neely, Gregory and Platts (2005) have identified manufacturing cost, value added cost, selling price, running costs and services cost as the measures of cost. Besides, De Toni and Tonchia (2001) classify material cost, labor cost, machinery energy cost, machinery material consumption cost, inventory cost, machine saturation, working capital productivity, total productivity, value-added productivity and value-added productivity /employee costs as the key cost-based measures of the organization. This research focuses on the set of accounting and financial metrics, including net profit (NP), return on assets (ROA), cash flows, and other financial ratios in order to measure financial conditions, profitability, efficiency, investment, financing activities, and other financial position (Kasie and Belay, 2013). Moreover, the set of cost measures includes labour costs, cost relative to competitors, cost of quality, overhead cost, total manufacturing cost, service cost or warranty, scrap cost, material costs, distribution cost, cost of goods sold or sales running cost per unit,





and value added cost per unit. All are used for measuring operational cost (Bhatti, Awan and Razaq, 2014).

In this research, accounting-oriented measurement capability is defined as the firm's ability to evaluate the performance of profitability, efficiency, operational costs and financial condition by depending on a set of accounting, financial, and cost metrics for providing feedback regarding the overall related financial operational performance, comparing benefits and costs of actions, and tracking budget utilization capability (Bititci et al., 2009; De Toni and Tonchia, 2001; Neely, Gregory and Platts, 2005; Taticchi, Tonelli and Cagnazzo, 2010). The set of financial and accounting measures include net profit (NP), return on assets (ROA), cash flows, and other financial ratios use to measure the overall financial condition, profitability, efficiency, investing and financing activities and other. Likewise, the set of cost measures includes labor costs, cost relative to competitors, the cost of quality, overhead cost, total manufacturing cost, service cost or warranty, scrap cost, material costs, distribution cost, the cost of goods sold/sales running cost per unit, and value added cost per unit.

The previous literature review involves the relationship between accounting-oriented measurement capability and its four consequences that include sustainable organizational commitment, organizational citizenship behavior, continuous organizational loyalty, and organizational competitiveness. For instance, Schneider et al. (2003) developed a model of the relationship and investigated the relationships among employee attitudes, high-performance work practices, and organizational financial performance. The result finds that financial performance measures (i.e. return on assets; earnings per share) propel employee attitudes, and also financial measures are the cause of increasing overall job satisfaction and satisfaction with pay and security. Afterward, Johnson, Davis and Albright (2009) empirically explore the relationship between financial performance measures by using return on assets and employee attitudes. Then, the result indicated that financial measures have a positive impact on employee attitudes (i.e. job satisfaction, pay satisfaction, organizational commitment, and organizational justice). The organization that combines financial and non-financial performance measures is perceived having procedural fairness, and is associated with greater organizational commitment and employees' job performance (Lau and Moser, 2008). Besides, Wallace (1997) finds the firm which chooses to use a financial measure



(residual income), together with incentive compensation plans can change managerial actions and behavior of its managers. Accounting-oriented measurement can reduce an employee's ambiguity and conflict as well as enhance performance (Burney and Widener, 2007). Robson (2005) finds that a well-designed IPMSS changes employee behavior and automatically leads to improve staff performance. The comprehensiveness of a performance measurement system has a positive impact on a manager's cognition and motivation. The strong linkage between performance measures and organizational strategy improves the high level of managers' job satisfaction (Hall, 2008). Burney, Henle and Widener (2009) find that IPMSS has positively affected the organizational citizenship behaviors of employees from the perspective of procedural justice. From the aforementioned, accounting-oriented measurement capability is likely to be the cause of greater sustainable organizational commitment, organizational citizenship behavior, added continuous organizational loyalty, and organizational competitiveness. Therefore, the hypotheses are proposed as follows:

***Hypothesis 2a: The higher the accounting-oriented measurement capability is, the more likely that a firm will gain greater sustainable organizational commitment.***

***Hypothesis 2b: The higher the accounting-oriented measurement capability is, the more likely that a firm will gain greater organizational citizenship behavior.***

***Hypothesis 2c: The higher the accounting-oriented measurement capability is, the more likely that a firm will gain greater continuous organizational loyalty.***

***Hypothesis 2d: The higher the accounting-oriented measurement capability is, the more likely that a firm will gain greater organizational competitiveness.***

#### Indicator-Based Assessment Focus

Indicators are known as key performance indicators, or key success indicators to help a firm in determining and measuring progress toward goals. Indicators that are completely linked up with strategies and goals support understanding, report the level of



strategic success, and explain cause-and-effect relationships. The firm's good indicators can reduce employee's ambiguity and conflict, and enhance firm performance (Burney and Widener, 2007). The performance indicators are defined by Gosselin (2005) as the physical values to be applied for measuring, comparing, managing, and tracking overall performance. In the previous literature, key performance indicators are popular, such as quality, flexibility, delivery, reliability, safety, and environment/community perspective (Bhatti, Awan and Razaq, 2014; Heckl and Moormann, 2010; Parmenter, 2009; Slack, Chambers and Johnston, 2007). The indicator-based assessment focus has the important role of ensuring that firms are managing in the right direction, and achieving targets and objectives. An indicator-based assessment can provide information to identify strengths and weaknesses and supports continuous improvement (Amaratunga and Baldry, 2002). Furthermore, it is used to compare and classify the different performance between organizations in the same industry, and also the different outcomes of departments, teams and individuals (Ghalayini and Noble, 1996; Mapes and Szwejczewski, 1997; Parmenter, 2009). The indicator-based assessment is brought to evaluate and control the operational processes within the organization. When the firm's strategies and indicators are in alignment, the senior managers can improve the operational process to follow the mission and vision of the firm and the requirements of employees and stakeholders as well (Artley and Stroh, 2001). Thus, the firms which have adopted an indicator-based assessment focus, evaluate the performance of the internal business process which can meet their employees' targets to be in the same direction with the firm's goals.

In this research, indicator-based assessment focus (the third dimension of IPMSS) is defined as the firm's ability to measure the key success units of the internal business process which are linked to supplier performance and community satisfaction by relying on the set of diverse indicators for tracking overall process performance, providing feedback outcome, and using it to control all operational processes (Bhatti, Awan and Razaq, 2014; Gosselin, 2005; Heckl and Moormann, 2010; Parmenter, 2009). Moreover, the set of internal business process indicators refers to orders delivered on time, failure cost (internal and external), process efficiency, and product cycle times which are used to measure the improvement of delivery time, enhancing product and service quality, increasing process efficiency, and reducing product cycle times (Kasie and Belay, 2013). Moreover, the set of supplier performance indicators includes the



defect rate for measuring the improvement of material quality, the lead time for assessing the decreasing lead time, and raw material costs. Besides, the set of community perspective indicators includes community complaints of perceiving community satisfaction, as well as scrapes and wastages reduced for reducing pollution (Kaplan and Norton, 1992; Kasie and Belay, 2013; Neely, Adams and Crowe, 2001).

The previous literature review of the relationship between the indicator-based assessment focus and its consequences consist of sustainable organizational commitment, organizational citizenship behavior, and continuous organizational loyalty, and organizational competitiveness. For example, Kasie and Belay, (2013) investigate the relationship between multi-criteria performance measurement and firm performance improvement to find that the criteria performance measurement which focuses on process/operation, social, and environmental measures, and supplier partnership performance, improve better business performance. Van der Stede, Chow and Lin (2006) find that the performance measurement diversity benefits a firm's performance, especially when the firms which use both the objective non-financial measures (i.e. internal operating, employee-oriented, customer-oriented) and subjective financial measures in the performance measurement system have a better performance than other firms. The indicator-based assessment focus continuously establishes and improves an organization's success and performance (Bhatti, Awan and Razaq, 2014). Also, Burney, Henle and Widener (2009) find that whenever IPMSS (i.e. multiple non-financial measures) is linked to the compensation contract, it directs employees' attention properly and motivates their behavior to be aligned with organizational goals. Also, it positively affects employees' organizational citizenship behavior as well. Lau and Moser (2008) indicate that non-financial indicators positively are related to organizational commitment. Dossi and Patelli (2010) find that non-financial performance indicators which emphasize the perspective of internal processes and a person's assessment are positively associated with the firm's performance evaluation. Lee and Yang (2011) find that the performance measurement system strategy which integrates and recognizes internal business process perspectives and other related perspectives of the balanced scorecard (BSC), enhance the firm performance. Moreover, IPMSS has a positive impact on performance through its relations with job-relevant information, and lower levels of role ambiguity and conflict when strategic performance



measurement systems are closely linked to the firm's strategies (Burney and Widener, 2007; Hall, 2008). In summary, indicator-based assessment focus has the likelihood to positively affect sustainable organizational commitment, organizational citizenship behavior, improve continuous organizational loyalty and organizational competitiveness. Thus, the hypotheses are proposed as follows:

***Hypothesis 3a: The higher the indicator-based assessment focus is, the more likely that a firm will gain greater sustainable organizational commitment.***

***Hypothesis 3b: The higher the indicator-based assessment focus is, the more likely that a firm will gain greater organizational citizenship behavior.***

***Hypothesis 3c: The higher the indicator-based assessment focus is, the more likely that a firm will gain greater continuous organizational loyalty.***

***Hypothesis 3d: The higher the indicator-based assessment focus is, the more likely that a firm will gain greater organizational competitiveness.***

#### Value-added Evaluation Emphasis

When the performance of training and development are measured and tracked continuously to bring feedback outcomes to improve operations, it can enhance the organizational competitiveness to be greater than competitors (Taylor and Baines, 2012). It happens because organizational learning has as the starting point, training and developing their employees to overtake new technological advancements in time (Sadler-Smith, Spicer and Chaston, 2001). Thus, the successes of the organization are entirely dependent on its employees' productivity and performance. Furthermore, employee satisfaction is also the one success factor of a number of organizations (Bhatti, Awan and Razaq, 2014). If the employees have high satisfaction, they will generate greater customer satisfaction, and overall organizational performance would increase respectively (Leong, Snyder and Ward, 1990; Mapes and Szwejcowski, 1997).

In this research, value-added evaluation emphasis is defined as the firm's ability to assess the performance of training and development which can improve firm



value and employee satisfaction; by using the set of diverse non-financial measures for tracking the enhancement of their employees' productivity and skills, innovations, and the reduction of employee turnover; and providing feedback outcomes for inputting plans and decision-making in the future (Kaplan and Norton, 1992; Kasie and Belay, 2013; Neely, Adams and Crowe, 2001). Especially, the set of training and development indicators includes output/employee which is used to measure improving employee productivity. Then, innovation, which is used to measure of enhancing research and development, employee skill level and qualification growth are used to measure the increase of training and education, respectively (Kasie and Belay, 2013). Similarly, the set of employee perspectives indicators includes satisfied employees who are used to measure enhancing employee satisfaction, accident frequency rates, which are used to measure and the reduction of accidents and employee turnover.

The review of the previous literature on the relationship between value-added evaluation emphasis and its consequences consist of sustainable organizational commitment, organizational citizenship behavior, continuous organizational loyalty, organizational competitiveness. For example, Lee and Yang (2011) find that firms which emphasize the perspective of innovation and learning growth, including the set of the number of new service/product launches, employee satisfaction, on the job training hours, and employees' suggestions that use for measuring in the integrated performance measurement system strategy, have positively associated with firm performance. Burney and Swanson (2010) identify that the performance measurement of learning and growth is the key part of balanced scorecard characteristics, and confirms the positive relationships between the ability of the firm to link performance measures with strategies and manager's job satisfaction. Furthermore, Kasie and Belay (2013) find that tracking the employee' satisfaction and the outcomes of training and development can improve business performance. Bhatti, Awan and Razaq (2014) find that an indicator of employee satisfaction has a positive impact on the organization's overall performance. Van der Stede, Chow and Lin (2006) find that a firm which selects the choices of performance measures that are employee-oriented are the key part of the performance measurement system has performance higher than other firms. Moreover, performance measurement system is positively associated with employee commitment (Bart, 2001). The implementation of various strategies within a firm can enhance organizational



competitiveness through high organizational commitment (Okabe, 2005). Moreover, Robson (2005) finds that a well-designed performance measurement system that can change employee behavior automatically leads to improving a staff's performance. As mentioned above, value-added evaluation emphasis has the potential likelihood to increase greater sustainable organizational commitment, enhance organizational citizenship behavior, improve continuous organizational loyalty, and realize organizational competitiveness. Thus, the hypotheses are proposed as follows:

***Hypothesis 4a: The higher the value-added evaluation emphasis is, the more likely that a firm will gain greater sustainable organizational commitment.***

***Hypothesis 4b: The higher the value-added evaluation emphasis is, the more likely that a firm will gain greater organizational citizenship behavior.***

***Hypothesis 4c: The higher the value added evaluation emphasis is, the more likely that a firm will gain greater continuous organizational loyalty.***

***Hypothesis 4d: The higher the value added evaluation emphasis is, the more likely that a firm will gain greater organizational competitiveness.***

#### Revenue-Oriented Criterion Implementation

Revenue measure is a financial measure which is implemented to track and evaluate the revenue variance and the sales growth of organizations (Bititci et al., 2009). Parmenter (2009) suggests that sales, sales by product, and sales growth rate are the key financial measures to assess the organizational performance. Similarly, Bhatti, Awan and Razaq (2014) confirm that sales, sales by product, and sales growth rate are the key performance indicators of the organizations. Meanwhile, Hofer, Eisl and Mayr (2012) measured performance by revenue growth, return on sales and others. Moreover, sales, profits, and margins in the financial statement are often considered static and backward-looking, regard marketing's short-term value to the firm (Ambler, Kokkinaki and Puntoni, 2004; Clark, 2001; Lebas and Euske, 2002).





Revenue-oriented criterion implementation is the fifth dimension of IPMSS. In this research, revenue-oriented criterion implementation is defined as the firm's ability to measure the performance of sales and revenue by using the set of various revenue metrics to analyze and track the revenue variance, sales growth, the increase in total revenues, and to input outcomes for sales forecast and planning in the long-term (Clark, Abela and Ambler, 2006; Kasie and Belay, 2013; Morgan, Clark and Gooner, 2002; Parmenter, 2009). Sales growth refers to the amount by which the average sales volume of a firm's products or services has typically grown from year to year.

A review of the previously involved literature on the relationship between the revenue-oriented criterion implementation and its consequences is as follows: Kasie and Belay (2013) use sales growth as the key financial metrics to examine how multi-criteria performance measurement influences business performance improvement, but the result does not find such a relationship. On the other hand, Bhatti, Awan and Razaq (2014) find that financial performance indicators, including sales, sales by product, and sales growth rate are the key components that have a positive impact on the overall performance of the organizations. Hall (2008) finds that the comprehensiveness of performance measurement systems influences managers' cognition and motivation. Likewise, the organizations that use both financial and non-financial performance measurement can improve organizational commitment and employee job performance (Lau and Moser, 2008). Financial measures help reduce employee's ambiguity and conflict, and enhance performance (Burney and Widener, 2007). Besides, O'Sullivan, Abela and Hutchinson (2009) find the ability of marketing performance measurement have a positive impact on the firm's performance and organizational citizenship behaviors (Burney, Henle and Widener, 2009). Based on all the discussion, revenue-oriented criterion implementation is likely to positively associated with sustainable organizational commitment, organizational citizenship behavior, continuous organizational loyalty, and organizational competitiveness. Therefore, the hypotheses are proposed below:

***Hypothesis 5a: The higher the revenue-oriented criterion implementation is, the more likely that a firm will gain greater sustainable organizational commitment.***





***Hypothesis 5b: The higher the revenue-oriented criterion implementation is, the more likely that a firm will gain greater organizational citizenship behavior.***

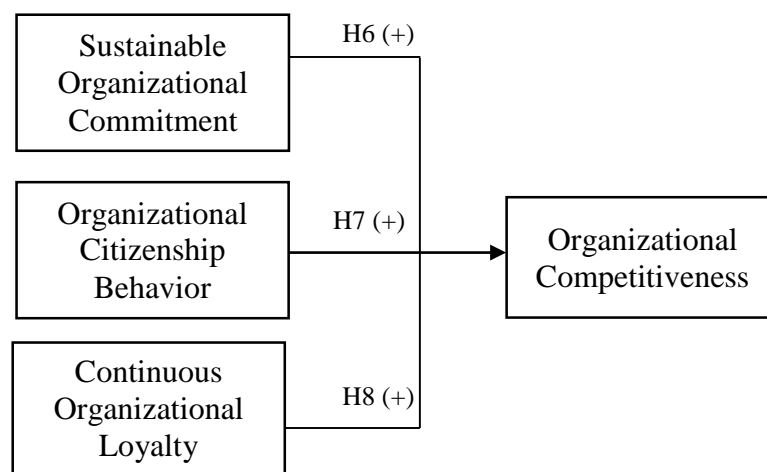
***Hypothesis 5c: The higher the revenue-oriented criterion implementation is, the more likely that a firm will gain greater continuous organizational loyalty.***

***Hypothesis 5d: The higher the revenue oriented criterion implementation is, the more likely that a firm will gain greater organizational competitiveness.***

#### Consequences of Integrated Performance Measurement System Strategy

This section focuses on the effects of sustainable organizational commitment, organizational citizenship behavior, and continuous organizational loyalty on organizational competitiveness as shown in Figure 3, and the effects of organizational competitiveness on firm success as shown in Figure 4.

Figure 3: The Effects of Sustainable Organizational Commitment, Organizational Citizenship Behavior, and Continuous Organizational Loyalty on Organizational Competitiveness.



### Sustainable Organizational Commitment

Organizational commitment is considered as one key factor to increase organizational competitiveness due to high performance is driven by commitment (Wood, 1999). Especially, firms integrate their employees' commitment to corporate strategies (Lincoln and Kalleberg, 1990). The use of organizational strategy enhances organizational competitiveness through high organizational commitment (Okabe, 2005). Firms attempt to achieve growth in the long-term through compiling the capabilities of all concerned members; and individuals are expected to fully participate in the system. Organizational commitment is an attitude in the form of attachment which exists between the individual and the organization to reflect the relative strength of employees' psychological identification and involvement with the firms (Jaramillo, Mulki and Marshall, 2005). It is viewed as an employee's intention to work in the organization in the long-term. Moreover, the psychological bond is reflected by individuals to act in ways consistent with the interests of the organization to be the definition of organizational commitment (Schwepker, 2001). Likewise, Porter et al. (1974) state that organizational commitment in view of the individual is an individual's belief and the acceptance of the organization's goals and values, a willingness to work to follow those goals, and the desire to remain a member of the firm. Waitip, Jhundra-indra and Raksong (2015) identify that organizational commitment awareness is the firms that have focused on employees' behavior and attitudes toward organizational benefits about the employees' emotional attachment, identification and involvement under the costs that the employees have associated with leaving the organization, and feelings of obligation to remain with the firm. Therefore, sustainable organizational commitment in this research is defined as the employees' expressive belief and attitude about the acceptance of the firm's goals and values, together with they are willing to work based on their organizational targets and plans under desiring and intending to remain with the organization forever without various rewards (Jaramillo, Mulki and Marshall, 2005; Porter et al., 1974; Schwepker, 2001).

The prior literature review on sustainable organizational commitment and organizational competitiveness (such as in Elizur and Koslowsky, 2001) find that employee involvement and commitment to the organizational goals and objectives improve the overall performance of organizations. Employee commitment will increase



when they feel an affiliation with the organization and when they recognize themselves as a part of the organization. Wood (1999) found that high commitment improves firm performance. Besides, the implementation of new strategies can enhance organizational competitiveness through high organizational commitment (Okabe, 2005). In summary, sustainable organizational commitment has the potential likelihood to increase organizational competitiveness. Hence, the hypothesis is proposed below:

***Hypothesis 6: The higher the sustainable organizational commitment is, the more likely that a firm will gain greater organizational competitiveness.***

#### Organizational Citizenship Behavior

Organizational citizenship behavior is a special type of work behavior that is defined as individual behavior that is beneficial to the firm, is discretionary, and not directly or explicitly recognized by the formal reward system (Alizadeh et al., 2012; Organ, 1988). The good behavior of the organization's member can improve the performance of employees and organizations to provide for stable organizational performance (Kataria, Garg and Rastogi, 2013). Especially, the high organizational citizenship behavior of employees has an important role to enhance organizational competitiveness (Alizadeh et al., 2012) and higher market share achievement (Noble, Sinha and Kumar, 2002). Organizational citizenship behavior is also the center of building a social psychology that helps reduce friction, and increase the operational efficiency and performance of the firm (Kataria, Garg and Rastogi, 2013).

In this research, organizational citizenship behavior is defined as the action and behaviors of organizational members involve cooperation in operations both the in- role and extra-role behavior under the contexts of performance management system usage, including altruism, conscientiousness, sportsmanship, courtesy and civic virtue behavior (Organ, Podsakoff and MacKenzie, 2006). In detail, altruism refers to the members' behavior showing generous, helpful, and bounteous for members. Conscientiousness refers to the revealing personal responsibility for the job which leads to the firm's success. Sportsmanship refers to accepting the other's opinion, and avoiding complaining or acting negatively. Courtesy refers to performing any act to decrease



problems in the workplace, to be participatory, and to increase firm performance. Civic virtue refers to member collaboration and the member behavior that positively affects firm success (Organ, Podsakoff and MacKenzie, 2006).

The previous literature reviews on the relationship between organizational citizenship behaviors and organizational competitiveness find that organizational citizenship behaviors have a positive influence on competitiveness and profitability (Alizadeh et al., 2012; Organ, 1988). Correspondingly, Podsakoff and Mackenzie (1997) find that organizational citizenship behavior increases firm value and firm performance (Pragoddee and Ussahawanitchakit, 2013). It improves the firm's success and firm value (Kittikunchotiwut and Ussahawanitchakit, 2012). Kataria, Garg and Rastogi (2013) suggest that organizational citizenship behavior has a significant, positive effects on organizational performance (operating efficiency and customer service quality), and organizational effectiveness (productivity, flexibility, adaptability, efficiency, managerial effectiveness, and stable performance). Besides, Podsakoff et al. (2009) find that organizational citizenship behavior positively relates to organizational effectiveness, which is measured by unit productivity, efficiency, profitability, and cost reduction. Organizational citizenship behavior has a positive relationship with firm performance (Maharani, Tirana and Noermijati, 2013), and leads to higher market share achievement (Noble, Sinha and Kumar, 2002). In summary, organizational citizenship behavior has the likelihood to increase organizational competitiveness. Hence, the hypothesis is proposed below:

***Hypothesis 7: The higher the organizational citizenship behavior is, the more likely that a firm will gain greater organizational competitiveness.***

#### Continuous Organizational Loyalty

Organizational loyalty brings about encouraging a firm to outsiders, and protecting and defending it against external threats under adverse circumstances (Organ, Podsakoff and MacKenzie, 2006). Organizational loyalty causes employee's retention with the firm and spreading positive word of mouth about the firm, while retention is employees upholding their professional relationship with the firm to feel an affective commitment to their organization (Jauhari and Singh, 2013). Moreover, organizational



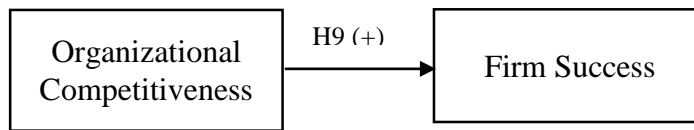
loyalty refers to “identification with and allegiance to the organization’s leaders and the firm as a whole, transcending the parochial interests of individuals, groups and departments” (Van Dyne, Graham and Dienesch, 1994, p. 767). Also, it includes the employees expressing a positive attitude about the organization to outsiders (Kernodle, 2007). Besides, loyalty also includes dedication as employees perceive their work as a significant and meaningful pursuit (Kataria, Garg and Rastogi, 2013). Firms need to look after employees who are energetic, dedicated and absorbed in their work (Bakker and Schaufeli, 2008). Thus, continuous organizational loyalty in this research is defined as the employees’ expressive efforts that consist of allegiance, respect, honesty, and dedication to the organization in the long-term, to attempt to provide positive opinions, and to encourage of their organization to outsiders (Bakker and Schaufeli, 2008; Kataria, Garg and Rastogi, 2013; Van Dyne, Graham and Dienesch, 1994).

The previous literature review on the relationship between continuous organizational loyalty and organizational competitiveness finds that organizational loyalty improves productivity, efficiency, and profit (Silvestro, 2002). Antoncic and Antoncic (2011) find that employee loyalty can contribute to greater efficiency, better business outcomes, firm growth, and reduction of employee turnover to achieve business objectives and growth. Additionally, Matzler and Renzl (2006) provide strong empirical evidence regarding the significant role that employee loyalty plays to improve the operational performance of the organization (Elegido, 2013). Furthermore, Waitip, Janjarasjit and Raksong (2015) find that there is a positive relationship between organizational loyalty concern and corporate competitiveness. It prevents loss of knowledgeable employees together with reduced recruitment and training expenditures for new employees (or replacement costs) (Ramlall, 2004; Snell and Dean, 1992). Based on the literature review above, higher continuous organizational loyalty can provide greater organizational competitiveness. Hence, the hypothesis is proposed below:

***Hypothesis 8: The higher the continuous organizational loyalty is, the more likely that a firm will gain greater organizational competitiveness.***



Figure 4: The Effect of Organizational Competitiveness on Firm Success.



#### Organizational Competitiveness

In any organization, maintaining a competitive advantage is critical to success (Yitmen, 2011). Competitive advantage reflects financial performance, resources and capabilities underlying a competitive advantage that differs from other firms. Generally, an organizational competitiveness plays an important role to improve the firms' performance (i.e. market shares, sales growth, and other performance) (Testa, Iraldo and Frey, 2011). Organizational competitiveness is a firm's economic strength and interfaces between the firm and its market (Murths, 1998; Rao and Holt, 2005). This includes corporate image improvements, service quality improvements, customer satisfaction, higher productivity, and profits. Intarapanich and Ussahawanitchakit (2011) suggest that a firm's competitiveness is its capability to create a superior performance in the same industry, such as organizational creativity, new operational strategy, new products and new services. Therefore, organizational competitiveness in this research is defined as the superiority of the organization when compared to other competitors in the same industry, including effective resource management, innovation, market shares, sales growth, corporate image, service quality, customer satisfaction, and productivity (Àlvarez, Marin and Fonfría, 2009; Murths, 1998; Rao and Holt, 2005).

The relationship between organizational competitiveness and firm success follow the resource-based view theory, which is the capability of firms to establish superior performance in the same industry that includes intangible assets which are valuable, rare and inimitable resources that lead to superior performance (Barney, 1991). Organizational competitiveness positively affects firm successes and survival (Bharadwaj and Menon, 2000; Porter, 1985). Firm competitiveness enhances and improves a firm's success that results from the implementation of new strategies and product innovation, leading to access to new markets, and a firm's superior success (Prasertsang, Ussahawanitchakit and Jhundra-indra, 2012). Furthermore, Yitmen (2012)



finds that there is a positive relationship between competitiveness and innovation drivers, and further explains that the greater competitive capability improves higher innovative capability. This indicates that stronger competitiveness leads to higher success through the development of the optimal dynamic capabilities within the firms. Thus, the hypothesis is proposed below:

***Hypothesis 9: The higher the organizational competitiveness is, the more likely that a firm will gain greater firm success.***

#### Firm Success

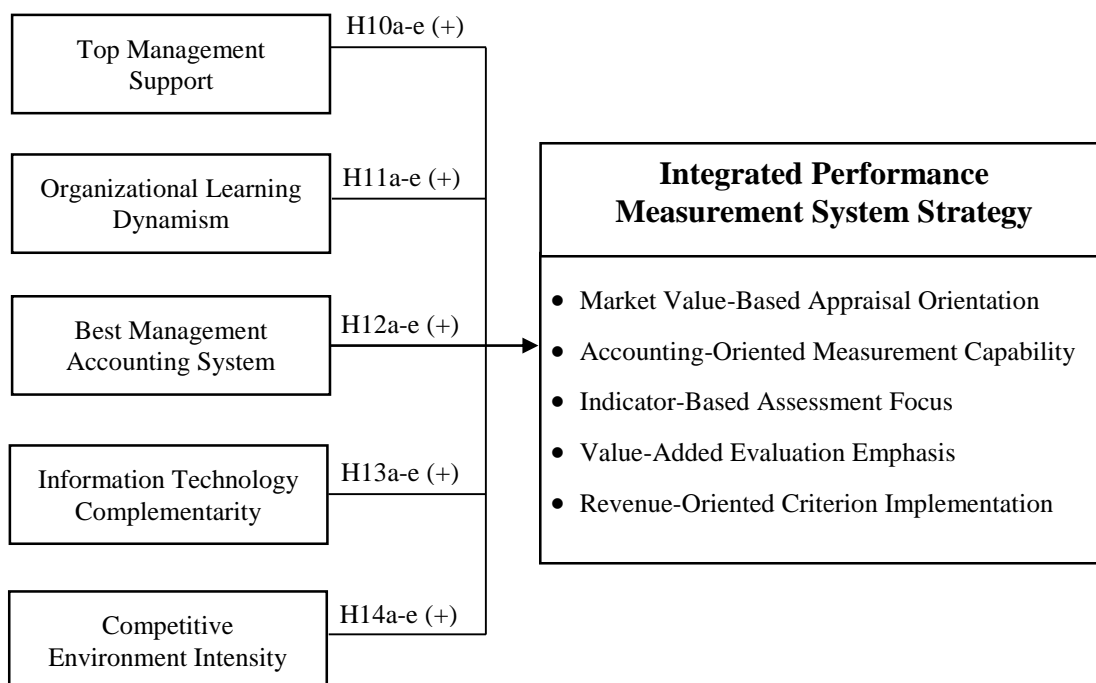
A firm's success is propelled by the suitable incorporation among the chosen strategies, a firm's competency, the high-level performance, and the behavior of employees. The most successful firms in an intensely competitive situation rely on several strategies and various full capabilities to respond to situations that have occurred within the organization to manage and improve firm performance and survival (Mohrman, Finegold and Mohrman, 2003). In addition, firm success is measured by many outcomes, such as financial position, internal business processes, learning, customer satisfaction and performance perspective (Cadez and Guilding, 2008; Chalatharawat and Ussahawanitchakit, 2009). Therefore, firm success in this research refers to the organization's goal achievement and higher firm performance, together with the continued abilities to retain customers, the excellence of innovations and operational processes, the high competency of members, and financial position stability (Mohrman, Finegold and Mohrman, 2003).

#### **The Effects of Antecedent variables on Integrated Performance Measurement System Strategy**

This section focuses the effects of the antecedents of IPMSS such as top management support, organizational learning dynamism, best management accounting system, information technology complementarity and competitive environment intensity on IPMSS, which is shown in Figure 5.



Figure 5: The Effects of the Antecedents on Integrated Performance Measurement System Strategy



### Top Management Support

Top management support in this research is defined as the chief executives who continuously promote and push forward of developing and implementing new techniques, strategies, and methods within the organization (Foster and Swenson, 1997; Krumwiede, Suessmair and Mac Donald, 2007). Top managers are those who have the highest authority, and their decision-making highly influences the overall operations of the organization (Morakul and Wu, 2001). Particularly, top managements have to be responsible for the decision-making of the organization to respond to the change in external environments (Liang et al., 2007). Top management support is the main driver of the organization's strategic programs and initiatives (Mintzberg, 1979). Furthermore, the potential of top management influence on the employees' actions in ethically uncertain and ambiguous situations may not be clearly outlined by a firm's policy (Carter and Jennings, 2004).





The importance of top management support is confirmed by these researchers: Barton, Shenkir and Walker (2002), Dabari and Saidin (2014), Kleffner, McGannon and Lee (2003) that it influences the creation of organizational values, and develops suitable management styles to direct organizational choice and improve the firm's performance (Dai, Montabon and Cantor, 2015; Hambrick and Mason, 1984). Likewise, the top management support simplifies the provision of adequate financial and human resources to direct organizational actions (Colbert, 2004). Moreover, the change of top management support, leadership, and commitment has an important influence on the implementation of the management activities within a firm (Lambert, Stock and Ellram, 1998). Actually, the lack of top management support is an important reason for the failure of management practices (Hillary, 2004) because the manager who will provide the general support has to achieve a better system and will also encourage its usage for decision-making. Especially, Franco and Bourne (2003) find that top management support is a key factor that influences the increase in using a firm's performance measurement system. Therefore, top management support is likely to be the capability of a firm's IPMSS, so that the hypotheses are proposed as follows:

***Hypothesis 10a: The higher the top management support is, the more likely that a firm will gain greater market value-based appraisal orientation.***

***Hypothesis 10b: The higher the top management support is, the more likely that a firm will gain greater accounting-oriented measurement capability.***

***Hypothesis 10c: The higher the top management support is, the more likely that a firm will gain greater indicator-based assessment focus.***

***Hypothesis 10d: The higher the top management support is, the more likely that a firm will gain greater value-added evaluation emphasis.***

***Hypothesis 10e: The higher the top management support is, the more likely that a firm will gain greater revenue-oriented criterion implementation.***



### Organizational Learning Dynamism

The organizational learning enhances sustainable competitive advantage and firm survival (Zahra, 2012). Organizational learning is the process of acquiring, distributing, integrating, and creating information and knowledge among organizational members (Dixon, 1992; Huber, 1991; Wang and Ellinger, 2011). It still is the process that improves actions through better knowledge and understanding (Fiol and Lyles, 1985). Learning promotes entrepreneurial activities by enabling companies to innovate, create new business, and renew operations (Zahra, 2008). In addition, organizational learning causes the development of new knowledge and has the potential to change the behavior of both the individual and the organization (Murray and Donegan, 2003). Especially, dynamic learning is the firm's attempt at learning both from the internal and external environment in heterogeneous, unfamiliar, and dynamic international environments (Kaleka and Berthon, 2006; Luo, 2000). Thus, organizational learning dynamism in this research is defined as the process of acquiring, creating, and developing new information and knowledge of the organization by attempting to learn from both internal and external environments that are heterogeneous, unfamiliar and changeable, together with the encouragement of sharing new knowledge and ideas among members of the organization (Kaleka and Berthon, 2006; Luo, 2000).

The possession of deploying and upgrading capabilities is a principal factor in global success and has a major role in the predicting of competitive position. Especially, the organizational learning capability that is appropriate to environmental characteristics and organizational requirements can achieve the greater payoff and long-term growth (Luo, 2000). The learning of employees leads to the development of competitively valuable organizational resources and capabilities through comparative advantage (Sharma, 2000). Firms that have operation processes involving exporting and investing, often face the challenge of learning about heterogeneous, unfamiliar, and dynamic international environments (Kaleka and Berthon, 2006). The previous literature reviews showed that organizational education and understanding have a greater influence on the way manage organizations through performance measures (Franco and Bourne, 2003). Likewise, Rompho (2009) supports that learning and growth are factors that affect the success of performance measurement system strategy, and more explains that firms that emphasize employee awareness of long-term performance will make the performance



measurement systems more successful. Marc et al. (2010) confirm that knowledge about management tools are the most important determinants of integrated performance measurement system usage. Therefore, organizational learning dynamism is important for creating new capabilities of the firm by requiring IPMSS as a new capability that is developed. Those reasons have led to related hypotheses proposed as below:

***Hypothesis 11a: The higher the organizational learning dynamism is, the more likely that a firm will gain greater market value-based appraisal orientation.***

***Hypothesis 11b: The higher the organizational learning dynamism is, the more likely that a firm will gain greater accounting-oriented measurement capability.***

***Hypothesis 11c: The higher the organizational learning dynamism is, the more likely that a firm will gain greater indicator-based assessment focus.***

***Hypothesis 11d: The higher the organizational learning dynamism is, the more likely that a firm will gain greater value-added evaluation emphasis.***

***Hypothesis 11e: The higher the organizational learning dynamism is, the more likely that a firm will gain greater revenue-oriented criterion implementation.***

#### Best Management Accounting System

Management accounting system is used for creating information within the organization to facilitate managers' decisions which must be consistent with the firm's strategic goals and for control of operational processes (Anthony and Govindarajan, 2001; Cheng, Lockett and Schulz, 2003; Chong and Eggleton, 2003). Moreover, the management accounting system is the formal system to provide information both internal and external of an organization in order to report performance and adapt information outcomes for planning, budgeting, and predicting the future (Bouwens and Abernethy, 2000). The best management accounting system has an influence on the manager's behavior of management that leads to the achievement of organizational objectives (Chia, 1995; Horngren et al., 2002). Moreover, a study of Atkinson, Kaplan



and Young (2004) explains that management accounting system is generated to support decision-makers to assess whether an organization is going to achieve its objectives. Furthermore, the best accounting system is often associated with a suitable accounting system process, a technology, an organized set of manual and computerized accounting methods, procedures, and controls established to gather, record, classify, analyze, summarize, interpret, and present accurate and timely accounting information for management decisions (Zhang and Zhou, 2007). Thus, best management accounting system in this research is defined as the formal system of data collection to create and report the management accounting information within the organization to facilitate and adapt information for interpreting, planning, forecasting future events and control processes, while the collected information is accurate and reliable (Anthony and Govindarajan, 2001; Chong and Eggleton 2003; Zhang and Zhou, 2007).

The previous related literature review on the relationship between the best management accounting system and IPMSS finds that the management accounting system effectiveness has a positive impact on the performance evaluation effectiveness, cost information accuracy corporate practice efficiency, and a firm's goal achievement (Lata and Ussahawanitchakit, 2015). In addition, the best management accounting system has significantly affected the quality of decisions by increasing managers' information and enhancing their ability to make organizationally desirable judgments and decisions (Sprinkle, 2003). Moreover, the best management accounting system is positively and significantly associated with greater organizational strategies capacity (Waweru, 2008). William and Seaman (2002) indicate that the best management accounting system, which is a component of the accounting system, can provide value-added information for controlling activities to achieve the department's performance objectives. Based on the literature reviewed above, the best management accounting system has the potential likelihood to affect each dimension of IPMSS. Thus, the hypotheses are proposed as follows:

***Hypothesis 12a: The higher the best management accounting system is, the more likely that a firm will gain greater market value-based appraisal orientation.***



***Hypothesis 12b: The higher the best management accounting system is, the more likely that a firm will gain greater accounting-oriented measurement capability.***

***Hypothesis 12c: The higher the best management accounting system is, the more likely that a firm will gain greater indicator-based assessment focus.***

***Hypothesis 12d: The higher the best management accounting system is, the more likely that a firm will gain greater value-added evaluation emphasis.***

***Hypothesis 12e: The higher the best management accounting system is, the more likely that a firm will gain greater revenue-oriented criterion implementation.***

#### Information Technology Complementarity

Information technology (IT) is a powerful tool to have an important role in creating the firm's success. Information technology also includes computers and the related digital communication technology for increasing broad power to reduce the costs of coordination, communications, and information-processing within the organizations (Brynjolfsson and Hitt, 2000). Information technology in a business context is still perceived of that as the application of computers, as well as telecommunications equipment to store, retrieve, transmit and manipulate information. The rapid growth and progress of information technology and high IT competency stimulate firms to have the need to increase their competence, both in knowledge and in management learning (Najafi and Goodarzi, 2012). Information technology develops and improves the abilities and efficiency of business operations, productivity, and innovation of the firm (Baroni and Araujo, 2001; Perrott, 2007). Particularly, when the firm's competitors endlessly invest in developing their information technology, it have pressured the firm to require much money as well to invest more in its information technology to change the way of working, to be able to compete with competitors, create sustainability, and improve performance (Allred and Swan, 2004; Xue, Ray and Sambamurthy, 2012). Besides, Hurwitz (2003) explains that current information technology complicates and challenges on IT executives. They must spend much money in creating and developing the potential of the information technology system in the organization. More details



about keywords of this variable are complementarity which is defined by Nevo (2007), which refers to the positive outcome of combining different parts together and creating a whole greater than the sum of its individual parts. Therefore, information technology complementarity in this research is defined as the complete progress and development of information technology to compel firms to need to select high-efficiency information technology for supporting the firm's strategy management system; and improving the efficiency of operations, productivity, and innovation (Baroni and Araujo, 2001; Najafi and Goodarzi, 2012; Perrott, 2007).

The benefits of information technology complementarity are the linkage and access to each department's information in the firm. It reduces the cost of coordination and the repetition of information, improves the internal communication efficiency, and makes a whole of information processing (Barua et al., 2004; Brynjolfsson and Hitt, 2000; Nevo, 2007). In the previous research, IT complementarity enhances the ability of performance measurement system usage within the organizations (Franco and Bourne, 2003). Moreover, Rompho (2009) supported that information technology support has a positive effect on performance measurement systems. Information technology support increases accuracy and reduces the staff's workload. Information technology complementarity plays a part in improving the ability to learn and create knowledge, increasing speed, expanding memory and minimizing communication errors (Wissner, 2011). Information technology investment increases financial and market performance (Bharadwaj, 2000). Besides, Kleis et al. (2012) assert that IT increases the innovation of the firm. Wissner (2011) reveals that the benefits of information and communication technology affect the growth of labor productivity in Germany. Moreover, information technology complementarity gives valuable assistance because it can improve higher business decision efficiency (Connor and Martinsons, 2006; Gilman, 2003). Moreover, Lee et al. (2006) find a positive relationship between IT complementarity and the extent of inter-organizational cost management capability. Moorthy et al. (2012) indicate that the potential of information technology in the management accounting field reduces the complexity of information calculation and provides information options for effective decision-making. Moreover, IT complementarity can improve the efficiency of the accounting department; produce results effortlessly, timely and accurately. Based on the



literature review, information technology complementarity is likely to affect each dimension of IPMSS. Thus, the hypotheses are proposed as follows:

***Hypothesis 13a: The higher the information technology complementarity is, the more likely that a firm will gain greater market value-based appraisal orientation.***

***Hypothesis 13b: The higher the information technology complementarity is, the more likely that a firm will gain greater accounting-oriented measurement capability.***

***Hypothesis 13c: The higher the information technology complementarity is, the more likely that a firm will gain greater indicator-based assessment focus.***

***Hypothesis 13d: The higher the information technology complementarity is, the more likely that a firm will gain greater value-added evaluation emphasis.***

***Hypothesis 13e: The higher the information technology complementarity is, the more likely that a firm will gain greater revenue-oriented criterion implementation.***

#### Competitive Environment Intensity

The competitive environment influences firm performance, which includes market competition intensity, the change of product prices, the ability to create product differentiation, product distribution, the change in government regulations or policies, and the ability of customer relations of other competitors (Chong and Rundus, 2004). Competitive intensity means the degree of competition that firms face (Zhao and Cavusgil, 2006). It is the scope of external environments that is characterized by extreme competition (Matusik and Hill, 1998). The intensive of the competitive environment is the cause of difficulty, complexity, uncertainty, and risk in the business operations of firms (Nurittamont and Ussahawanitchakit, 2010). Therefore, competitive environment intensity in this research is defined as the degree of business competitive severity that firms are facing, including: 1) the uncertainty of customer demand, 2) the



increase of competitors in the same industry, 3) the fluctuation of product price in the marketplace, 4) the high ability of other competitors, and 5) the changing of government regulation or policy to influence firm performance and increase difficulties in business operations (Chong and Rundus, 2004; Nurittamont and Ussahawanitchakit, 2010; Zhao and Cavusgil, 2006).

The contingency theory helps explain the fit between contextual factors, and the design of management control systems that are relevant to superior organizational performance (Chenhall, 2003; Ittner and Larcker, 1997; Lee and Yang, 2011; Luft and Shields, 2003). Similarly, the previous related literature review on the relationship between the competitive environment intensity and IPMSS. For instance, Bastian and Muchlish (2012) find that the perceived environmental uncertainty and non-financial performance measurement systems are significantly associated. Moreover, the external environmental factor has an impact on the effectiveness of IPMSS (France and Bourne, 2005). Henri (2006) provides support that environmental uncertainty has a positive effect on the diversity of performance measurement usage. Likewise, France and Bourne (2003) indicated that industry characteristics such as competitive market, public, regulated or private sectors influence the selection and use of performance measurement. Consistent with the results of Gosselin (2005), the findings show that firms that operate in a more unstable environment are likely to use customer measures to supplement financial measures. Lee and Yang (2011) indicate that when market competition is more intensive, there is a positive relationship between the development stage of performance measurement system and the higher level of firm performance. Marc et al. (2010) found that the contextual factors about company size and industry and the knowledge of management tools have the most important role determining whether the firm will integrate their performance measurement system. Based on all literature reviews, competitive environment intensity has the likelihood to influence each dimension of IPMSS. Thus, the hypotheses are proposed as follows:

***Hypothesis 14a: The higher the competitive environment intensity is, the more likely that a firm will gain greater market value-based appraisal orientation.***





**Hypothesis 14b:** *The higher the competitive environment intensity is, the more likely that a firm will gain greater accounting-oriented measurement capability.*

**Hypothesis 14c:** *The higher the competitive environment intensity is, the more likely that a firm will gain greater indicator-based assessment focus.*

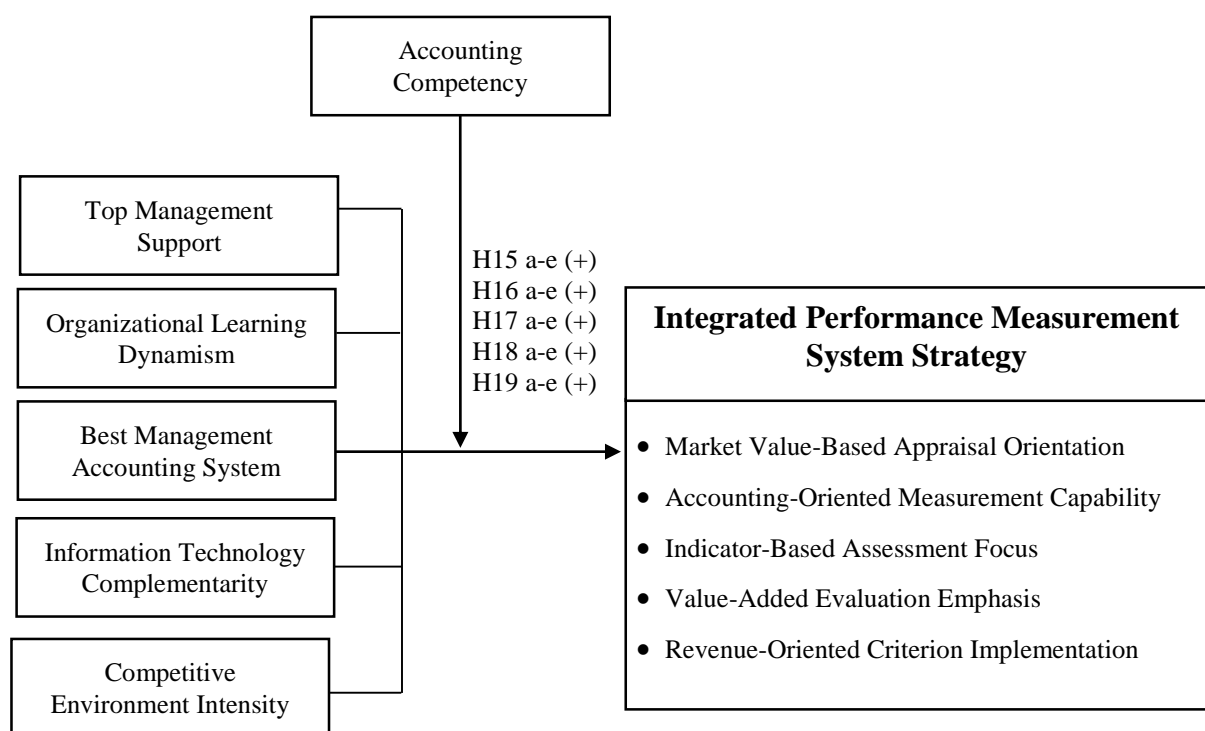
**Hypothesis 14d:** *The higher the competitive environment intensity is, the more likely that a firm will gain greater value-added evaluation emphasis.*

**Hypothesis 14e:** *The higher the competitive environment intensity is, the more likely that a firm will gain greater revenue-oriented criterion implementation.*

### The Moderating Effects of Accounting Competency

This section emphasizes the moderating effects of accounting competency on the relationship among IPMSS and its antecedents as shown in Figure 6.

Figure 6: Roles of Accounting Competency as a Moderator



### Accounting Competency

This research proposes accounting competency as the moderator variable. Accounting competency is the ability of systems which can link all sub-systems of accounting together to create stability, the ease of use, speed, easy maintenance, effective communication, and the satisfaction of users (Harzallah and Vernadat, 2002). Moreover, the firm's accounting competency should conform to a dynamic environment and support efficiency management practice and operational performance (Chankaew, Ussahawanitchakit and Boonlua, 2012; Prempee, Ussahawanitchakit and Boonlua, 2013). It is often used to collect and store financial accounting data in order to be instruments to assist management, in areas such as planning, controlling and evaluating. The accounting system provides the necessary accounting information, both internal and external to users. Especially, in a decision-making process, a well-designed accounting system provides information to managers in time. It helps the decision-making of managers to be effective, timely and accurate, plays critical roles in fulfilling managers' obligations of accountability, and provides the information to explain the usage of resources and operations (Kara and Kilic, 2011). Furthermore, an accounting system monitors the long-term organizational performance, and reports the achievements of plans and goals. It supports capabilities that manage to achieve the organizational goals. Therefore, accounting competency in this research is defined as the firm's accounting system to link the various sub-accounting systems together for stability, ease of use, speed, easy maintenance, and efficient communication, when used combined with highly-skilled accountants (Harzallah and Vernadat, 2002).

The highly-skilled accountant is an accountant who has capacities that help predict competent performance in a certain job. It encompasses the knowledge, skills, abilities, experience and personality of accountant such as in elective training, cognitive abilities, and technical skills (Baird, Harrison and Reeve, 2007; Kennedy and Dresser, 2005; Ley and Albert, 2003). The highly-skilled accountants still relate their ability to use technological innovation in that there is an impact on performance, knowledge-sharing and coordination (Tippins and Sohi, 2003). Accounting competency plays the moderator role in the relationship between a firm's capabilities of management accounting techniques, and internal and external contextual factors (Chankaew, Ussahawanitchakit and Boonlua, 2012). Besides, a firm's accounting competency that



complies with dynamic environments supports efficiency management practices and operational performance (Prempree, Ussahawanitchakit and Boonlua, 2013). Based on the literature review, a higher level of accounting competency will positively moderate the relationship among the antecedents which include top management support, organizational learning dynamism, best management accounting system, information technology complementarity, competitive environment intensity, and IPMSS. Thus, the hypotheses are proposed as follows:

***Hypothesis 15a: Accounting competency positively moderates the relationship between top management support and market value-based appraisal orientation.***

***Hypothesis 15b: Accounting competency positively moderates the relationship between top management support and accounting-oriented measurement capability.***

***Hypothesis 15c: Accounting competency positively moderates the relationship between top management support and indicator-based assessment focus.***

***Hypothesis 15d: Accounting competency positively moderates the relationship between top management support and value-added evaluation emphasis.***

***Hypothesis 15e: Accounting competency positively moderates the relationship between top management support and revenue-oriented criterion implementation.***

***Hypothesis 16a: Accounting competency positively moderates the relationship between organizational learning dynamism and market value-based appraisal orientation.***



*Hypothesis 16b: Accounting competency positively moderates the relationship between organizational learning dynamism and accounting-oriented measurement capability.*

*Hypothesis 16c: Accounting competency positively moderates the relationship between organizational learning dynamism and indicator-based assessment focus.*

*Hypothesis 16d: Accounting competency positively moderates the relationship between organizational learning dynamism and value-added evaluation emphasis.*

*Hypothesis 16e: Accounting competency positively moderates the relationship between organizational learning dynamism and revenue-oriented criterion implementation.*

*Hypothesis 17a: Accounting competency positively moderates the relationship between best management accounting system and market value-based appraisal orientation.*

*Hypothesis 17b: Accounting competency positively moderates the relationship between best management accounting system and accounting-oriented measurement capability.*

*Hypothesis 17c: Accounting competency positively moderates the relationship between best management accounting system and indicator-based assessment focus.*

*Hypothesis 17d: Accounting competency positively moderates the relationship between best management accounting system and value-added evaluation emphasis.*



*Hypothesis 17e: Accounting competency positively moderates the relationship between best management accounting system and revenue-oriented criterion implementation.*

*Hypothesis 18a: Accounting competency positively moderates the relationship between information technology complementarity and market value-based appraisal orientation.*

*Hypothesis 18b: Accounting competency positively moderates the relationship between information technology complementarity and accounting-oriented measurement capability.*

*Hypothesis 18c: Accounting competency positively moderates the relationship between information technology complementarity and indicator-based assessment focus.*

*Hypothesis 18d: Accounting competency positively moderates the relationship between information technology complementarity and value-added evaluation emphasis.*

*Hypothesis 18e: Accounting competency positively moderates the relationship between information technology complementarity and revenue-oriented criterion implementation.*

*Hypothesis 19a: Accounting competency positively moderates the relationship between competitive environment intensity and market value-based appraisal orientation.*

*Hypothesis 19b: Accounting competency positively moderates the relationship between competitive environment intensity and accounting-oriented measurement capability.*



*Hypothesis 19c: Accounting competency positively moderates the relationship between competitive environment intensity and indicator-based assessment focus.*

*Hypothesis 19d: Accounting competency positively moderates the relationship between competitive environment intensity and value-added evaluation emphasis.*

*Hypothesis 19e: Accounting competency positively moderates the relationship between competitive environment intensity and revenue-oriented criterion implementation.*

## **Summary**

This chapter contains the conceptual model of the integrated performance measurement system strategy that develops from the resource-based view theory and the contingency theory. There are 19 hypotheses which are developed to test the effect of the integrated performance measurement system strategy on its consequences (i.e. sustainable organizational commitment, organizational citizenship behavior, continuous organizational loyalty, organizational competitiveness, and firm success); and to test the influence of antecedent variables (i.e. top management support, organizational learning dynamism, best management accounting system, competitive environment intensity, and information technology complementarity) on the integrated performance measurement system strategy. Moreover, this research also examines the moderating effects of accounting competency on the relationship between integrated performance measurement system strategy and its antecedents. The summary of the hypothesized relationships is shown in Table 4.

The next chapter shows how the research methods are conducted. It provides an insight into the sampling method used, the data collection techniques, and the various techniques that were used to analyze the data.



Table 4: Summary of Hypothesized Relationships

Hypotheses	Description of Hypothesized Relationships
H1a	The higher the market value-based appraisal orientation is, the more likely that a firm will gain greater sustainable organizational commitment.
H1b	The higher the market value-based appraisal orientation is, the more likely that a firm will gain greater organizational citizenship behavior.
H1c	The higher the market value-based appraisal orientation is, the more likely that a firm will gain greater continuous organizational loyalty.
H1d	The higher the market value-based appraisal orientation is, the more likely that a firm will gain greater organizational competitiveness.
H2a	The higher the accounting-oriented measurement capability is, the more likely that a firm will gain greater sustainable organizational commitment.
H2b	The higher the accounting-oriented measurement capability is, the more likely that a firm will gain greater organizational citizenship behavior.
H2c	The higher the accounting-oriented measurement capability is, the more likely that a firm will gain greater continuous organizational loyalty.
H2d	The higher the accounting-oriented measurement capability is, the more likely that a firm will gain greater organizational competitiveness.
H3a	The higher the indicator-based assessment focus is, the more likely that a firm will gain greater sustainable organizational commitment.
H3b	The higher the indicator-based assessment focus is, the more likely that a firm will gain greater organizational citizenship behavior.
H3c	The higher the indicator-based assessment focus is, the more likely that a firm will gain greater continuous organizational loyalty.
H3d	The higher the indicator-based assessment focus is, the more likely that a firm will gain greater organizational competitiveness.
H4a	The higher the value-added evaluation emphasis is, the more likely that a firm will gain greater sustainable organizational commitment.



Table 4: Summary of Hypothesized Relationships (continued)

Hypotheses	Description of Hypothesized Relationships
H4b	The higher the value-added evaluation emphasis is, the more likely that a firm will gain greater organizational citizenship behavior.
H4c	The higher the value-added evaluation emphasis is, the more likely that a firm will gain greater continuous organizational loyalty.
H4d	The higher the value-added evaluation emphasis is, the more likely that a firm will gain greater organizational competitiveness.
H5a	The higher the revenue-oriented criterion implementation is, the more likely that a firm will gain greater sustainable organizational commitment.
H5b	The higher the revenue-oriented criterion implementation is, the more likely that a firm will gain greater organizational citizenship behavior.
H5c	The higher the revenue-oriented criterion implementation is, the more likely that a firm will gain greater continuous organizational loyalty.
H5d	The higher the revenue-oriented criterion implementation is, the more likely that a firm will gain greater organizational competitiveness.
H6	The higher the sustainable organizational commitment is, the more likely that a firm will gain greater organizational competitiveness.
H7	The higher the organizational citizenship behavior is, the more likely that a firm will gain greater organizational competitiveness.
H8	The higher the continuous organizational loyalty is, the more likely that a firm will gain greater organizational competitiveness.
H9	The higher the organizational competitiveness is, the more likely that a firm will gain greater firm success.
H10a	The higher the top management support is, the more likely that a firm will gain greater market value-based appraisal orientation.
H10b	The higher the top management support is, the more likely that a firm will gain greater accounting-oriented measurement capability.





Table 4: Summary of Hypothesized Relationships (continued)

Hypotheses	Description of Hypothesized Relationships
H10c	The higher the top management support is, the more likely that a firm will gain greater indicator-based assessment focus.
H10d	The higher the top management support is, the more likely that a firm will gain greater value-added evaluation emphasis.
H10e	The higher the top management support is, the more likely that a firm will gain greater revenue-oriented criterion implementation.
H11a	The higher the organizational learning dynamism is, the more likely that a firm will gain greater market value-based appraisal orientation.
H11b	The higher the organizational learning dynamism is, the more likely that a firm will gain greater accounting-oriented measurement capability.
H11c	The higher the organizational learning dynamism is, the more likely that a firm will gain greater indicator-based assessment focus.
H11d	The higher the organizational learning dynamism is, the more likely that a firm will gain greater value-added evaluation emphasis.
H11e	The higher the organizational learning dynamism is, the more likely that a firm will gain greater revenue-oriented criterion implementation.
H12a	The higher the best management accounting system is, the more likely that a firm will gain greater market value-based appraisal orientation.
H12b	The higher the best management accounting system is, the more likely that a firm will gain greater accounting-oriented measurement capability.
H12c	The higher the best management accounting system is, the more likely that a firm will gain greater indicator-based assessment focus.
H12d	The higher the best management accounting system is, the more likely that a firm will gain greater value-added evaluation emphasis.
H12e	The higher the best management accounting system is, the more likely that a firm will gain greater revenue-oriented criterion implementation.



Table 4: Summary of Hypothesized Relationships (continued)

Hypotheses	Description of Hypothesized Relationships
H13a	The higher the information technology complementarity is, the more likely that a firm will gain greater market value-based appraisal orientation.
H13b	The higher the information technology complementarity is, the more likely that a firm will gain greater accounting-oriented measurement capability.
H13c	The higher the information technology complementarity is, the more likely that a firm will gain greater indicator-based assessment focus.
H13d	The higher the information technology complementarity is, the more likely that a firm will gain greater value-added evaluation emphasis.
H13e	The higher the information technology complementarity is, the more likely that a firm will gain greater revenue-oriented criterion implementation.
H14a	The higher the competitive environment intensity is, the more likely that a firm will gain greater market value-based appraisal orientation.
H14b	The higher the competitive environment intensity is, the more likely that a firm will gain greater accounting-oriented measurement capability.
H14c	The higher the competitive environment intensity is, the more likely that a firm will gain greater indicator-based assessment focus.
H14d	The higher the competitive environment intensity is, the more likely that a firm will gain greater value-added evaluation emphasis.
H14e	The higher the competitive environment intensity is, the more likely that a firm will gain greater revenue-oriented criterion implementation.
H15a	Accounting competency positively moderates the relationship between top management support and market value-based appraisal orientation.
H15b	Accounting competency positively moderates the relationship between top management support and accounting-oriented measurement capability.
H15c	Accounting competency positively moderates the relationship between top management support and indicator-based assessment focus.



Table 4: Summary of Hypothesized Relationships (continued)

Hypotheses	Description of Hypothesized Relationships
H15d	Accounting competency positively moderates the relationship between top management support and value-added evaluation emphasis.
H15e	Accounting competency positively moderates the relationship between top management support and revenue-oriented criterion implementation.
H16a	Accounting competency positively moderates the relationship between organizational learning dynamism and market value-based appraisal orientation.
H16b	Accounting competency positively moderates the relationship between organizational learning dynamism and accounting-oriented measurement capability.
H16c	Accounting competency positively moderates the relationship between organizational learning dynamism and indicator-based assessment focus.
H16d	Accounting competency positively moderates the relationship between organizational learning dynamism and value-added evaluation emphasis.
H16e	Accounting competency positively moderates the relationship between organizational learning dynamism and revenue-oriented criterion implementation.
H17a	Accounting competency positively moderates the relationship between best management accounting system and market value-based appraisal orientation.
H17b	Accounting competency positively moderates the relationship between best management accounting system and accounting-oriented measurement capability.
H17c	Accounting competency positively moderates the relationship between best management accounting system and indicator-based assessment focus.



Table 4: Summary of Hypothesized Relationships (continued)

Hypotheses	Description of Hypothesized Relationships
H17d	Accounting competency positively moderates the relationship between best management accounting system and value-added evaluation emphasis.
H17e	Accounting competency positively moderates the relationship between best management accounting system and revenue-oriented criterion implementation.
H18a	Accounting competency positively moderates the relationship between information technology complementarity and market value-based appraisal orientation.
H18b	Accounting competency positively moderates the relationship between information technology complementarity and accounting-oriented measurement capability.
H18c	Accounting competency positively moderates the relationship between information technology complementarity and indicator-based assessment focus.
H18d	Accounting competency positively moderates the relationship between information technology complementarity and value-added evaluation emphasis.
H18e	Accounting competency positively moderates the relationship between information technology complementarity and revenue-oriented criterion implementation.
H19a	Accounting competency positively moderates the relationship between competitive environment intensity and market value-based appraisal orientation.
H19b	Accounting competency positively moderates the relationship between competitive environment intensity and accounting-oriented measurement capability.



Table 4: Summary of Hypothesized Relationships (continued)

Hypotheses	Description of Hypothesized Relationships
H19c	Accounting competency positively moderates the relationship between competitive environment intensity and indicator-based assessment focus.
H19d	Accounting competency positively moderates the relationship between competitive environment intensity and value-added evaluation emphasis.
H19e	Accounting competency positively moderates the relationship between competitive environment intensity and revenue-oriented criterion implementation.



## CHAPTER III

### RESEARCH METHODS

The prior chapter reviews the concept of integrated performance measurement system strategy (IPMSS) with a theoretical foundation; a literature review of the antecedents, moderators, its consequences, the conceptual framework; and hypotheses development. This chapter explains the research methods which are organized as follows. The first section is the sample selection and data collection procedures, including the population and sample, data collection, and the test of non-response bias. Secondly, the measurements of variables are developed. Thirdly, methods include the test of validity and reliability, and statistical techniques, including the regression equations which are presented. Finally, the table of the summary of the definitions and the operational variables of the constructs is included.

#### Sample Selection and Data Collection Procedure

##### Population and Sample

The population of this research is Thai-listed firms, which refers to the firms that have registered with the Stock Exchange of Thailand. In light of this significant understanding, Thai-listed firms play an important role in promoting and enhancing the economic growth and stability in Thailand (SET, 2013). These firms are appropriate for being investigated because: 1) Thai-listed firms represent a large firm which has sufficient resources and higher capacities to use a variety of measures to track their performance. 2) These firms focus on bringing the performance evaluation system that comes into use within the organization to increase the higher level of the firm's capability and to emphasize using a number of methods for measuring their overall performance. Examples are Balanced Scorecard (BSC), Economic Value Added (EVA), Key Performance Indicator (KPI), Human Resource Scorecard (HR Scorecard), Activity-Based Costing (ABC), Accounting Measures and other indicators (Rompho, 2009). 3) The business operational nature of Thai-listed firms gives importance to the successful effort in methods of accounting, and the performance measurement system



diversity to be included in such methods for adding and providing the information of a comprehensive performance outcome to executives, leading to increasing the quality of decision-making. 4) Thai-listed firms emphasize providing the importance of human resources and always recognize that employees are a key factor in the organization's success. Hence, these firms agree to pay higher compensation to retain employees who have high ability, and submit to provide for them participation in the ownership of the firm for enhancing loyalty and commitment, (SET, 2013). Particularly, the firms which integrate their employees' attitudes into their organizational strategies together lead to increased organizational competitiveness (Lincoln and Kalleberg, 1990; Okabe, 2005). Correspondingly, these firms attempt to generate long-term growth through compiling the capabilities of all concerned members who are expected to participate fully in the system. Therefore, Thai-listed firms are the appropriate population in this research when IPMSS is applied in firms through the positive behavior of their employees leading to enhancing the potential of competitiveness and success of these firms in the long-term.

The sample of this research is the Thai-listed firms which are selected from the database of the Stock Exchange of Thailand on its website is <http://www.set.or.th/>, as of April 11, 2016. The population size amounts to 708 firms but there are 12 rehabilitative firms that are identified by the stock exchange of Thailand. Some of these rehabilitative firms may be associated with the scope of revocation of their right because they have problems with financial statements and operational processes. Thus, the population size in this research is 696 firms which excluding 12 such rehabilitative firms. The required sample size is a representative of the Thai-listed firms in this research is 248 firms by using the minimum usable sample size of Krejcie and Morgan (1970). However, since organizational research often uses a survey as a data-collection method, the response rates are typically lower than 100 percent (Bartlett, Kotrlik and Higgins, 2001). This research assumes a required sample size as 20 percent, and to maximize the response rate to 100 percent, this research systematically confines 1,240 (248x5) firms as a sampling frame. The 20 percent response rate for a mail survey, without an appropriate follow-up procedure, is deemed sufficient (Aaker, Kumar and Day, 2001). However, in this research, with a population of 696 firms, the population and sample become the same groups. Therefore, 696 firms are selected as the sample for data collection in this research.



The chosen key informant is the accounting executive (e.g. accounting director, accounting manager) of each Thai-listed firm because they have the most extensive knowledge about the characteristics and style of business operations, its strategy, and performance measurement system. Even though some researchers claim that multiple sources of data are preferable for the better understanding of research phenomenon (Wagner, Rau and Lidemann, 2010), other studies find that the accounting executive can provide multiple informants that are reliable and valid (Srichanapun, Ussahawanitchakit and Boonlua, 2013).

#### Data Collection

This dissertation is conducted by using the questionnaire survey because it is a widely-used method for large-scale data collection in behavioral accounting research and the representative sample can be collected from the chosen population in a variety of locations at a low cost (Kwok and Sharp, 1998). Furthermore, this tool is suitable because a mail survey helps a greater number of firms at a lower cost and the elimination or reduction of bias (Dillman, 1991; Snyder and Elliard, 2012).

The final questionnaires were mailed out on June 15, 2016, to Thai-listed firms accompanied by a cover letter outlining the rationale and aims of this research.

Table 5: Details of Questionnaire Mailing

Details	Numbers
Questionnaires Mailed	696
Returned Questionnaires	1
Successful Questionnaires Mailed	695
Received Questionnaires	155
Incomplete Questionnaires	2
Complete and Usable Questionnaires	153
Response Rate (153*100/695)	22.01%

The questionnaires were mailed directly to the accounting executive (e.g. accounting director, accounting manager) of each Thai-listed firm by mail. The plan





was defined to collect the data within eight weeks. During the first four weeks, questionnaires were answered and returned to the researcher. After the first four weeks, for increasing the response rate, a follow-up letter and online questionnaire were sent to firms and e-mails of the firms after four weeks, respectively. Specifically, it was a reminder to the firms that had not yet replied to the questionnaire and asked them to cooperate in answering it. Afterward, the completed questionnaires were sent from firms to the researcher by the prepared return envelopes for ensuring confidentiality. Each package of the sent letter comprised a cover letter containing an explanation of the research, a questionnaire, and a postage-prepaid return envelope.

The questionnaires were directly distributed to 696 Thai-listed firms, of which the successful questionnaire mailing had 695 surveys, and one was returned because a firm rejected answering the questionnaire. Then, returned questionnaires included 134 responses in the first four weeks, and 21 more responses in the next four weeks. Thus, a total of received questionnaires included 155 responses. However, there are only 153 complete and usable questionnaires. Afterward, this research uses all of the received questionnaires which produced a response rate for regression analysis. The effective response rate was approximately 22.01 percent. According to Aaker, Kumar and Day (2001), the response rate for a mail survey, if there is greater than 20 percent, is considered acceptable. The details of the usable questionnaires show in Table 5.

The questionnaire consists of seven parts. The choices of parts one through closed-ended questions because they are easier and quicker for respondents to answer, and easier to code and statistically analyze. Part one asks about the personal information of each accounting executive and has seven 7 items: gender, age, marital status, educational level, working experience, average revenues per month, and working position. Part two asks about the information and details of the firms such as the type of business, the period of time registered in The Stock Exchange of Thailand, the period of time in operating the business, authorized capitals, the total assets of the firm, the number of employees, and average revenues per year. Part three to part six requests to measure each of the constructs in the conceptual model, a total of 70 items is composed. These items are adapted from previous related literature and are created from the definition of each variable. It is designed as a five-point Likert scale, ranging from 1



(strongly disagree) to 5 (strongly agree). The last part is the recommendations and suggestions about integrated performance measurement system strategy.

As to the details of parts three through seven, part three inquires the perception of five dimensions of integrated performance measurement system strategy (IPMSS), including market value-based appraisal orientation, accounting-oriented measurement capability, indicator-based assessment focus, value-added evaluation emphasis, and revenue-oriented criterion implementation. Part four asks about the perceptions of the consequences of integrated performance measurement system strategy, consisting of sustainable organizational commitment, organizational citizenship behavior, continuous organizational loyalty, organizational competitiveness and firm success. Part five inquires about the perceptions of internal factors that influence five dimensions of integrated performance measurement system strategy, consisting of top management support, organizational learning dynamism, best management accounting system, and accounting competency. Part six asks about the perceptions of external factors, including information technology complementarity and competitive environment intensity. Finally, part seven includes an open-ended question for an informant's suggestions and opinions. This questionnaire is attached in Appendix G and H (questionnaire in the Thai and English version).

#### Test of Non-Response Bias

The test of non-response bias is how to protect from possible response bias problems between respondents and non-respondents. A non-response bias is tested by comparing the pattern of answers received between first four weeks and last four weeks of mail returned (Armstrong and Overton, 1977). The respondents were divided into two groups: early and late respondents (Oppenheim, 1996). Hence, checking on the possible responses from occurring bias problems between respondents and non-respondents, a non-response bias test is used to confirm that non-respondents are not different from all respondents. A non-response bias was conducted using a t-test comparison of the demographic information between the groups of early and late respondents. Then responses from the first mailing group were used to compare with those received from the second mailing group on the basis of the demographic of firm characteristics. If the t-test result is not statistically significant difference between early



and late respondents, it can be concluded that the non-response bias does not cause a major problem (Armstrong and Overton, 1977). The expected result should reveal non-statistically significant differences between them to reject a non-response bias (Mishra, 2006; Homburg et al., 2010; Leischnig and Enke, 2011).

A total of 153 received questionnaires is divided into two equal groups: the first 77 responses are treated as the early respondents (the first group), and the other 76 responses are treated as the late respondents (the second group). By employing a t-test statistic, the differences about the demographic of firm characteristics in terms of the period of time registered in The Stock Exchange of Thailand, the period of time in operating business, authorized capitals, the total assets of the firm, and average revenues per year, are compared.

The results are as follows: the period of time registered in The Stock Exchange of Thailand ( $t = 0.665$ ,  $p > 0.05$ ), the period of time in operating business ( $t = -0.431$ ,  $p > 0.05$ ), authorized capitals ( $t = 1.301$ ,  $p > 0.05$ ), the total assets of the firm ( $t = 0.328$ ,  $p > 0.05$ ), and average revenues per year ( $t = -0.634$ ,  $p > 0.05$ ). These results provide the evidence that there were no statistically significant differences between the two groups at a 95% confidence level. Therefore, it can be confidently mentioned that non-response bias is not a serious problem in this research (Armstrong and Overton, 1977). The results of non-response bias test are presented in Appendix E.

## Measurements

In this research, the measurement procedures involve the multiple item developments for measuring each construct in the conceptual model. All constructs are transformed into the operational variables for precise measuring. For measuring each construct in the conceptual model, all variables gained from the survey have been measured by a five-point Likert scale, which ranges from 1 (strongly disagree) to 5 (strongly agree). Accordingly, using multiple items provides a wider range of content of the conceptual definitions and the improvement of reliability (Neuman, 2006). Thus, all constructs in this research are abstractions that cannot be directly measured or observed and should also be measured by multiple items (Churchill, 1979). Besides, the variable measurements of this research are developed by the definitions and the relevant



literature as shown in Table 7 which provides the definition of each construct, the operational variables, and scale source. Therefore, the variable measurements of the dependent variable, independent variables, antecedent variables, mediating variables, moderating variable, and control variables of this research are elaborated as follows.

#### Dependent Variable

*Firm Success.* Firm success is defined as the organization's goal achievement and higher firm performance, together with the continued abilities to retain customers, the excellence of innovations and operational processes, the high competency of members, and financial position stability (Mohrman, Finegold and Mohrman, 2003). The construct of this variable is measured by using a five-item scale which is developed a new scale and based on its definition.

#### Independent Variables

This research consists of 15 independent variables. The main variable in this research is the construct of integrated performance measurement system strategy (IPMSS) which consists of five dimensions: market value-based appraisal orientation, accounting-oriented measurement capability, indicator-based assessment focus, value-added evaluation emphasis and revenue-oriented criterion implementation. These dimensions reflect the best aspects of IPMSS.

*Market value-based appraisal orientation.* Market value-based appraisal orientation refers to the firm's ability to measure the market and customer performance by using a set of several market metrics for tracking marketing efficiency, expansion of market share and customer satisfaction, and providing feedback regarding the outcomes of marketing efforts (Ahmed et al., 2011; Clark, Abela and Ambler, 2006; Kasie and Belay, 2013; Lamberti and Noci, 2010). The construct of this variable is measured by using a four-item scale which is developed a new scale and based on its definition.

*Accounting-oriented measurement capability.* Accounting-oriented measurement capability refers to the firm's ability to evaluate the performance of profitability, efficiency, operational costs and financial condition by depending on a set



of accounting, financial, and cost metrics for providing feedback regarding the overall related financial operational performance, comparing benefits and costs of actions, and tracking budget utilization capability (Bititci et al., 2009; De Toni and Tonchia, 2001; Taticchi, Tonelli and Cagnazzo, 2010). The construct of this variable is measured by using a four-item scale which is developed a new scale and based on its definition.

*Indicator-based assessment focus.* Indicator-based assessment focus refers to the firm's ability to measure the key success units of the internal business process which are linked to supplier performance and community satisfaction by relying on the set of diverse indicators for tracking overall process performance, providing feedback outcome, and using it to control all operational processes (Bhatti, Awan and Razaq, 2014; Gosselin, 2005; Heckl and Moormann, 2010). The construct of this variable is measured by using a four-item scale which is developed a new scale and based on its definition.

*Value-added evaluation emphasis.* Value-added evaluation emphasis refers to the firm's ability to assess the performance of training and development which can improve firm value and employee satisfaction; by using the set of diverse non-financial measures for tracking the enhancement of their employees' productivity and skills, innovations, and the reduction of employee turnover; and providing feedback outcomes for inputting plans and decision-making in the future (Bhatti, Awan and Razaq, 2014; Kasie and Belay, 2013; Neely, Adams and Crowe, 2001). The construct of this variable is measured by using a four-item scale which is developed a new scale and based on its definition.

*Revenue-oriented criterion implementation.* Revenue-oriented criterion implementation refers to the firm's ability to measure the performance of sales and revenue by using the set of various revenue metrics to analyze and track the revenue variance, sales growth, the increase in total revenues, and to input outcomes for sales forecast and planning in the long-term (Clark, Abela and Ambler, 2006; Kasie and Belay, 2013; Morgan, Clark and Gooner, 2002; Parmenter, 2009). The construct of this variable is measured by using a four-item scale which is developed a new scale and based on its definition.



### Antecedent Variables

IPMSS has been affected both internal and external factors. Thus, this research is assigned the internal and external factors as the antecedents of IPMSS. Internal factors include top management support, organizational learning dynamism, and best management accounting system. Besides, the external environmental factors include information technology complementary and competitive environment intensity.

*Top management support.* Top management support refers to the chief executives who continuously promote and push forward of developing and implementing new techniques, strategies, and methods within the organization (Foster and Swenson, 1997; Krumwiede, Suessmair and MacDonald, 2007). The construct of this variable is measured by using a four-item scale which is modified from Tontiset and Ussahawanitchakit (2010).

*Organizational learning dynamism.* Organizational learning dynamism refers to the process of acquiring, creating, and developing new information and knowledge of the organization by attempting to learn from both internal and external environments that are heterogeneous, unfamiliar and changeable, together with the encouragement of sharing new knowledge and ideas among members of the organization (Kaleka and Berthon, 2006; Luo, 2000). The construct of this variable is measured by using a five-item scale which is developed a new scale and based on its definition.

*Best management accounting system.* Best management accounting system refers to the formal system of data collection to create and report the management accounting information within the organization to facilitate and adapt information for interpreting, planning, forecasting future events and control processes, while the collected information is accurate and reliable (Anthony and Govindarajan, 2001; Chong and Eggleton, 2003; Zhang and Zhou, 2007). The construct of this variable is measured by using a four-item scale which is a new scale developed and based on its definition.

*Information technology complementarity.* Information technology complementarity refers to the complete progress and development of information



technology to compel firms to need to select high-efficiency information technology for supporting the firm's strategy management system; and improving the efficiency of operations, productivity, and innovation (Baroni and Araujo, 2001; Najafi and Goodarzi, 2012; Perrott, 2007). The construct of this variable is measured by using a four-item scale which a new scale is developed based on its definition.

*Competitive Environment Intensity.* Competitive environment intensity is defined as the degree of business competitive severity that firms are facing, including: 1) the uncertainty of customer demand, 2) the increase of competitors in the same industry, 3) the fluctuation of product price in the marketplace, 4) the high ability of other competitors, and 5) the changing of government regulation or policy to influence firm performance and increase difficulties in business operations (Chong and Rundus, 2004; Nurittamont and Ussahawanitchakit, 2010; Zhao and Cavusgil, 2006). The construct of this variable is measured by using a four-item scale which is a new scale and is developed based on its definition.

#### Mediating Variables

*Sustainable organizational commitment.* Sustainable organizational commitment is defined as the employees' expressive belief and attitude about the acceptance of the firm's goals and values, together with they are willing to work based on their organizational targets and plans under desiring and intending to remain with the organization forever without various rewards (Jaramillo, Mulki and Marshall, 2005; Porter et al., 1974; Schwepker, 2001). The construct of this variable is measured by using a five-item scale by which is developed a new scale and based on its definition.

*Organizational citizenship behavior.* Organizational citizenship behavior is defined as the action and behaviors of organizational members involve cooperation in operations both the in- role and extra-role behavior under the contexts of performance management system usage, including altruism, conscientiousness, sportsmanship, courtesy and civic virtue behavior (Organ, Podsakoff and MacKenzie, 2006). The construct of this variable is measured by using a five-item scale which is developed a new scale and based on its definition.



*Continuous organizational loyalty.* Continuous organizational loyalty is defined as the employees' expressive efforts that consist of allegiance, respect, honesty, and dedication to the organization in the long-term, to attempt to provide positive opinions, and to encourage of their organization to outsiders (Bakker and Schaufeli, 2008; Kataria, Garg and Rastogi, 2013; Van Dyne, Graham and Dienesch, 1994). The construct of this variable is measured by using a five-item scale which is developed a new scale and based on its definition.

*Organizational competitiveness.* Organizational competitiveness is defined as the superiority of the organization when compared to other competitors in the same industry, including effective resource management, innovations, market shares, sales growth, corporate image, service quality, customer satisfaction, and productivity (Àlvarez, Marin and Fonfría, 2009; Murths, 1998; Rao and Holt, 2005). The construct of this variable is measured by using a five-item scale which is modified from Prasertsang and Ussahawanitchakit (2012).

#### Moderating Variable

*Accounting competency.* Accounting competency refers to the firm's accounting system to link the various sub-accounting systems together for stability, ease of use, speed, easy maintenance and efficient communication, when used combined with highly-skilled accountants (Harzallah and Vernadat, 2002). The construct of this variable is measured by using a four-item scale. A new scale is developed, based on its definition.

#### Control Variables

Control variables in this research include firm age and firm size because these two control variables may influence the relationships between IPMSS, firm success and its antecedent variables. Firm size is measured by the total assets of the firm. Firm age is measured by the period of time registered and operated in The Stock Exchange of Thailand. The firm's success may be influenced by firm size and age because it may be able to achieve superior performance.





*Firm Age.* Firm age is a proxy for the firm's experience which is measured by the period of time registered on the Stock Exchange of Thailand (Srichanapun, Ussahawanitchakit and Boonlua, 2013). In this research, the firm's age becomes a control variable due to the firm's long experience under environmental uncertainty and complexity that can increase the very good opportunities in management and reduce risk in the business operations (Folta, 1998). Moreover, firms that have registered on the Stock Exchange of Thailand compared to always have different forms and regulations in their business operations general firms that are not on the Stock Exchange of Thailand. Besides, firm age is normally associated with the better ability of resource allocation and competitiveness (Lau, Wong and Eggleton, 2008). Previous empirical research confirms that there is a significant relationship between firm age and firm growth (Capelleras and Rabetino, 2008). Thus, firm age is one of the control variables to be represented by a dummy variable of which 0 means the firm has the period of time registered in the Stock Exchange of Thailand is less than or equal to 10 years, and 1 means the firm has the period of time registered in SET is more than 10 years.

*Firm Size.* Firm size is the total assets of the firm. Firm size is an important factor in that there is an impact on both structure and other control systems (Abdel-Kader and Luther, 2008). Many empirical contributions have affirmed that contextual factors play an important role in explaining the decision to use, design, and develop IPMSS. Especially, there is a long relationship between IPMSS usage and the larger businesses (Chenhall, 2003; Hoque and James, 2000; Verbeeten and Boons, 2009). It suggests that firm size affects the design and the use of IPMSS of each firm. It arises from greater decentralization and the structuring of activities. In large firms, a broader set of information and measurement issues arises (Kaplan and Atkinson, 1998). Marc et al. (2010) confirm that a large firm (measured as the value of total assets) is the most important determinants to affect the success of the integrated performance measurement system strategy usage. This research controls firm size by using the total assets of the firm as a proxy. Firm size is represented as a dummy variable, 0 refers to the total assets of the firm that are less than 10,000,000,000 baht, and 1 refers to the total assets of the firm that are equal to or more than 10,000,000,000 baht (Goodwin- Stewart and Kent, 2006).



## Methods

In this research, data is collected by using a questionnaire which is created from the definition and which is adapted from a wide review of the literature, in order to establish truthfulness and credibility. The questionnaire has been sent to two academic experts who reviewed the instrument and adjusted it to be a possible scale measure before sending it to the respondents to the questionnaire. Additionally, following this further, the pre-test method was appropriately conducted to assert the validity and reliability of the questionnaire. Afterward, all questionnaires were checked for accuracy before being forwarded to the respondents by a mailed survey. Then, the researcher waited for a reply for a test data analysis of hypotheses and assumption testing of multiple regression analysis.

### Validity and Reliability

*Validity.* Validity is the ability of a scale or measuring instrument to measure what is intended to be measured (Zikmund, 1997). This research tests the validity of the instrument to confirm that a measure or set of measures accurately represents the concept of this research. Two types of validity which are applied to the test in this research are content validity and construct validity. Validity refers to the degree to which the instruments ensure that a measure or set of measures accurately represents what it is supposed to measure. Likewise, Kwok and Sharp (1998) suggest that validity is the accuracy of a measurement concerned with whether the researcher measures what they want to measure. This research examines the content validity and constructs validity of the questionnaire.

*Content validity* is an inspection system to reflect the content universe to which the instrument will be generalized. This research, face validity, and content validity are improved by an extensive review of the literature questionnaires (Hair et al., 2010). The content validity of an instrument is also the measure that adequately covers the topics that have been defined as the relevant dimensions of the research (Cooper and Schindle, 2006). Moreover, two professionals in academic research were requested to review and suggest the necessary recommendation regarding the instrument to ensure



that all constructs were sufficient to cover the contents of the variables. After those two experts, who have experience in this area, reviewed the instrument in order to ensure the questionnaire design, they provided comments, accordingly adjusted it, and chose the best measurement with its conceptual definitions.

*Construct validity.* Construct validity refers to the consistency between a theoretical concept and a specific concept, measuring the instrument or procedure which is internally consistent (Trochim, 1999). This validity is evaluated by testing both convergent and discriminant validity. Convergent validity means the degree to which two measures are designed to measure the same construct related to that convergence, and it will be found if the two measures are highly correlated (Kwok and Sharp, 1998). Discriminant validity assesses the degree to which an operation is not similar to other operations that theoretically should not be similar (Trochim, 1999). The exploratory factor analysis (EFA) is used to test the new constructs (market value-based appraisal orientation, accounting-oriented measurement capability, indicator-based assessment focus, value-added evaluation emphasis, revenue-oriented criterion implementation, sustainable organizational commitment, organizational citizenship behavior, continuous organizational loyalty, firm success, best management accounting system, information technology complementarity, competitive environment intensity, and accounting competency) and to reduce the number of factors into a smaller set of single constructs or a high potential to inflate the component loading. Additionally, confirmatory factor analysis (CFA) is used to test the constructs developed from previous related research (organizational competitiveness, top management support, and organizational learning dynamism). Construct validity is used to investigate the underlying relationships of a large number of items and determine whether they can reduce to a smaller set of factors. As a rule-of-thumb, the acceptable cutoff score is 0.40 as a minimum (Nunnally and Bernstein, 1994). Table 6 shows the results of factor loadings of multi-item scales. It can be seen that each item of all variables is loaded on a single factor and the range of factor loadings is between 0.775-0.958. These values are greater than the cut-off score of 0.4 to indicate acceptable construct validity (see Appendix B). Besides, each of the items in a questionnaire is subjectively assessed by two related academic experts to ensure the content validity (see also Appendix A).



*Reliability.* Reliability is the degree to which the measurement is true and error-free, of the observed variable, and it indicates the degree of internal consistency between the multiple variables (Hair et al., 2010). Moreover, the reliability is the extent to which measurements of the particular test are repeatable (Nunnally, 1970). Hence, the more consistent the results are given by repeated measurements, the higher the reliability of the measurement procedure (Carmines and Zeller, 1979). The Cronbach's alpha coefficient is used as the measure of the internal consistency or reliability of the constructs (Hair et al., 2010). In this research, the first 30 returned questionnaires have been used for testing the validity and reliability. The recommendation of Cronbach's alpha coefficient should be equal to or greater than 0.70 to indicate that the measured items are similar enough to be considered acceptable (Nunnally and Bernstein, 1994). According to Table 6, the results of Cronbach's alpha coefficients are between 0.830-0.958 which exceeds the acceptable cut-off score. It can be concluded that the internal consistency of the entire scale exists in this research (see also Appendix B).

Table 6: Results of Validity and Reliability Testing

Variables	n	Validity (Factor Loadings)	Reliability (Cronbach's Alpha)
Firm Success (FSC)	30	0.856-0.942	0.941
Market Value-Based Appraisal Orientation (MBAO)	30	0.879-0.958	0.926
Accounting-Oriented Measurement Capability (AOMC)	30	0.775-0.906	0.873
Indicator-Based Assessment Focus (IBAF)	30	0.783-0.930	0.867
Value-Added Evaluation Emphasis (VAEE)	30	0.786-0.848	0.830
Revenue-Oriented Criterion Implementation (ROCI)	30	0.818-0.924	0.877
Sustainable Organizational Commitment (SOC)	30	0.794-0.932	0.923
Organizational Citizenship Behavior (OCB)	30	0.801-0.931	0.917
Continuous Organizational Loyalty (COL)	30	0.828-0.917	0.915
Organizational Competitiveness (OC)	30	0.801-0.903	0.896



Table 6: Results of Validity and Reliability Testing (continued)

Variables	n	Validity (Factor Loadings)	Reliability (Cronbach's Alpha)
Top Management Support (TMS)	30	0.819-0.925	0.903
Organizational Learning Dynamism (OLD)	30	0.830-0.911	0.918
Best Management Accounting System (MAS)	30	0.858-0.957	0.935
Information Technology Complementarity (ITC)	30	0.938-0.945	0.958
Competitive Environment Intensity (CEI)	30	0.826-0.921	0.907
Accounting Competency (AC)	30	0.806-0.948	0.904

### Statistical Techniques

In this research, before hypotheses testing, all of the raw data were checked, encoded, and recorded in a data file. Then, the basic assumption of regression analysis and data examined was tested. This process involved checking outlier, normality, autocorrelation, and linearity. The statistical techniques included factor analysis, variance inflation factor, correlation analysis, and regression analysis, each of which is fully discussed below.

*Variance inflation factor (VIF)*. Variance inflation factor is applied to test multicollinearity to argue that it is an indicator to measure a degree of multicollinearity among the independent variables in the regression model. The cut-off of VIF (to indicate multicollinearity) is whether the value is greater than 10 or not. It states that when the VIF value is more than 10, it indicates the problem of multicollinearity. On the other hand, when the VIF value is lower than 10, it suggests that multicollinearity is not a problem in a conceptual model (Hair et al., 2010). In this research, an analysis of collinearity statistics indicates that the range of VIF values is 1.019 – 8.919, which indicates that there is no multicollinearity problem (see also Appendix F).



*Correlation analysis.* This research uses Pearson Correlation Analysis to test the correlations among all variables. It measures the strength of the linear dependence between two variables. In other words, when any single independent variable is highly correlated with other independent variables, a multicollinearity problem seems to exist. It is likely to cause a confounded estimation of the regression coefficient, and it may reduce overall  $R^2$ . The cut-off criterion of intercorrelation between two variables is 0.80 or higher because it may have a multicollinearity problem (Hair et al., 2010). Whenever multicollinearity increases, it complicates the interpretation of the variables because the effects of the predictors are confounded due to the correlations among them. However, if the correlation coefficient values between independent variables are greater than 0.80, the multicollinearity problem will be identified by the variance inflation factor (VIF).

Thus, VIF and correlation analysis are used for testing of multicollinearity. Correlation analysis is utilized to investigate simply the interrelationships among all variables, while VIF is more related to statistical testing. Whenever a multicollinearity problem exists, factor analysis will be used for grouping highly correlated variables into the same factor. This is because those variables are strongly associated with each other and represent a single concept as a unidimensional construct.

*Regression analysis.* The Ordinary Least Squares regression analysis is used for testing all hypotheses to follow the conceptual model because it is appropriate for investigating the relationships among the dependent variables and independent variables which are based on data qualified as interval and categorical scales (Hair et al., 2010). The regression equation is a linear combination of the independent variables that is the best for explaining and predicting the dependent variables (Aulakh, Kotabe and Teegen, 2000). Before hypotheses testing, all raw data are diagnosed basic assumptions of regression analysis including autocorrelation, normality, heteroscedasticity, and linearity. The results test the basic assumption of regression analysis show that: the relationships between dependent and independent variables of each model are linear, the variance of error constant (no heteroscedastic problem), Durbin-Watson statistic does not exceed 2.5 (no autocorrelation) (Tabachnick and Fidell, 2000), and error has a normal distribution (see Appendix F). In addition, this research analyzes data which is calculated in the form of factor scores for all variables to avoid multicollinearity



problems. As a result, all hypotheses are transformed into 16 equations. Each equation consists of the main variables related to the hypothesis testing as described in the previous chapter. Two control variables (firm age and firm size) are used in every equation for hypothesis testing. The detail of each equation is presented as follow.

To investigate the effects of the five dimensions of integrated performance measurement system strategy (IPMSS) on sustainable organizational commitment is presented in Equation 1 as shown:

$$\text{Equation 1: } SOC = \alpha_{01} + \beta_1 MBAO + \beta_2 AOMC + \beta_3 IBAF + \beta_4 VAEE + \beta_5 ROCT + \beta_6 FA + \beta_7 FS + \varepsilon$$

To investigate the effects of the five dimensions of integrated performance measurement system strategy on organizational citizenship behavior is presented in Equation 2 as shown:

$$\text{Equation 2: } OCB = \alpha_{02} + \beta_8 MBAO + \beta_9 AOMC + \beta_{10} IBAF + \beta_{11} VAEE + \beta_{12} ROCT + \beta_{13} FA + \beta_{14} FS + \varepsilon$$

To investigate the effects of the five dimensions of integrated performance measurement system strategy on continuous organizational loyalty is presented in Equation 3 as shown:

$$\text{Equation 3: } COL = \alpha_{03} + \beta_{15} MBAO + \beta_{16} AOMC + \beta_{17} IBAF + \beta_{18} VAEE + \beta_{19} ROCT + \beta_{20} FA + \beta_{21} FS + \varepsilon$$

To investigate the effects of the five dimensions of integrated performance measurement system strategy on organizational competitiveness is presented in Equation 4 as shown:

$$\text{Equation 4: } OC = \alpha_{04} + \beta_{22} MBAO + \beta_{23} AOMC + \beta_{24} IBAF + \beta_{25} VAEE + \beta_{26} ROCT + \beta_{27} FA + \beta_{28} FS + \varepsilon$$



This equation is determined to test the impacts of sustainable organizational commitment, organizational citizenship behavior, and continuous organizational loyalty on organizational competitiveness, is presented in Equation 5 as shown:

$$\text{Equation 5: } OC = \alpha_{05} + \beta_{29}SOC + \beta_{30}OCB + \beta_{31}COL + \beta_{32}FA + \beta_{33}FS + \varepsilon$$

This equation is determined to examine the effect of organizational competitiveness on firm success and is presented in Equation 6 as shown:

$$\text{Equation 6: } FSC = \alpha_{06} + \beta_{34}OC + \beta_{35}FA + \beta_{36}FS + \varepsilon$$

These equations are determined to examine the role of the five antecedents: top management support, organizational learning dynamism, best management accounting system, information technology complementarity and competitive environment intensity which have an effect on five dimensions of IPMSS that are shown in Equations 7, 8, 9, 10 and 11 as follows:

$$\text{Equation 7: } MBAO = \alpha_7 + \beta_{37}TMS + \beta_{38}OLD + \beta_{39}MAS + \beta_{40}ITC + \beta_{41}CEI + \beta_{42}FA + \beta_{43}FS + \varepsilon$$

$$\text{Equation 8: } AOMC = \alpha_8 + \beta_{44}TMS + \beta_{45}OLD + \beta_{46}MAS + \beta_{47}ITC + \beta_{48}CEI + \beta_{49}FA + \beta_{50}FS + \varepsilon$$

$$\text{Equation 9: } IBAF = \alpha_9 + \beta_{51}TMS + \beta_{52}OLD + \beta_{53}MAS + \beta_{54}ITC + \beta_{55}CEI + \beta_{56}FA + \beta_{57}FS + \varepsilon$$

$$\text{Equation 10: } VAEE = \alpha_{10} + \beta_{58}TMS + \beta_{59}OLD + \beta_{60}MAS + \beta_{61}ITC + \beta_{62}CEI + \beta_{63}FA + \beta_{64}FS + \varepsilon$$

$$\text{Equation 11: } ROCI = \alpha_{11} + \beta_{65}TMS + \beta_{66}OLD + \beta_{67}MAS + \beta_{68}ITC + \beta_{69}CEI + \beta_{70}FA + \beta_{71}FS + \varepsilon$$





These equations are determined to examine the role of accounting competency, which moderates the relationship between five antecedent variables and five dimensions of IPMSS in Equations 12, 13, 14, 15 and 16 as shown:

$$\begin{aligned} \text{Equation 12: } MBAO = & \alpha_{12} + \beta_{72}TMS + \beta_{73}OLD + \beta_{74}MAS + \beta_{75}ITC + \beta_{76}CEI + \\ & \beta_{77}AC + \beta_{78}(TMS * AC) + \beta_{79}(OLD * AC) + \beta_{80}(MAS * AC) + \\ & \beta_{81}(ITC * AC) + \beta_{82}(CEI * AC) + \beta_{83}FA + \beta_{84}FS + \varepsilon \end{aligned}$$

$$\begin{aligned} \text{Equation 13: } AOMC = & \alpha_{13} + \beta_{85}TMS + \beta_{86}OLD + \beta_{87}MAS + \beta_{88}ITC + \beta_{89}CEI + \\ & \beta_{90}AC + \beta_{91}(TMS * AC) + \beta_{92}(OLD * AC) + \beta_{93}(MAS * AC) + \\ & \beta_{94}(ITC * AC) + \beta_{95}(CEI * AC) + \beta_{96}FA + \beta_{97}FS + \varepsilon \end{aligned}$$

$$\begin{aligned} \text{Equation 14: } IBAF = & \alpha_{14} + \beta_{98}TMS + \beta_{99}OLD + \beta_{100}MAS + \beta_{101}ITC + \beta_{102}CEI + \\ & \beta_{103}AC + \beta_{104}(TMS * AC) + \beta_{105}(OLD * AC) + \beta_{106}(MAS * AC) + \\ & \beta_{107}(ITC * AC) + \beta_{108}(CEI * AC) + \beta_{109}FA + \beta_{110}FS + \varepsilon \end{aligned}$$

$$\begin{aligned} \text{Equation 15: } VAAE = & \alpha_{15} + \beta_{111}TMS + \beta_{112}OLD + \beta_{113}MAS + \beta_{114}ITC + \beta_{115}CEI + \\ & \beta_{116}AC + \beta_{117}(TMS * AC) + \beta_{118}(OLD * AC) + \beta_{119}(MAS * AC) + \\ & \beta_{120}(ITC * AC) + \beta_{121}(CEI * AC) + \beta_{122}FA + \beta_{123}FS + \varepsilon \end{aligned}$$

$$\begin{aligned} \text{Equation 16: } ROCI = & \alpha_{16} + \beta_{124}TMS + \beta_{125}OLD + \beta_{126}MAS + \beta_{127}ITC + \beta_{128}CEI + \beta_{129}AC \\ & + \beta_{130}(TMS * AC) + \beta_{131}(OLD * AC) + \beta_{132}(MAS * AC) + \\ & \beta_{133}(ITC * AC) + \beta_{134}(CEI * AC) + \beta_{135}FA + \beta_{136}FS + \varepsilon \end{aligned}$$

Where;

FSC	= Firm Success
IPMSS	= Integrated Performance Measurement System Strategy
MBAO	= Market Value-Based Appraisal Orientation
AOMC	= Accounting-Oriented Measurement Capability
IBAF	= Indicator-Based Assessment Focus
VAAE	= Value-Added Evaluation Emphasis
ROCI	= Revenue-Oriented Criterion Implementation



SOC	= Sustainable Organizational Commitment
OCB	= Organizational Citizenship Behavior
COL	= Continuous Organizational Loyalty
OC	= Organizational Competitiveness
TMS	= Top Management Support
OLD	= Organizational Learning Dynamism
MAS	= Best Management Accounting System
ITC	= Information Technology Complementarity
CEI	= Competitive Environment Intensity
AC	= Accounting Competency
FA	= Firm age
FS	= Firm size
$\varepsilon$	= Error term
$\alpha$	= Constant
$\beta$	= Coefficient

## Summary

This chapter provides details about the research methods for gathering the data and examining all constructs in the conceptual model to answer the research questions. The content involves the sample selection and the data collection procedure, including the population and the sample of Thai-listed firms. This data collection was drawn from the Stock Exchange of Thailand (SET) on its website, <http://www.set.or.th/>. Based on this database, there are 696 firms. All questionnaires are sent to accounting executives (e.g. accounting director, accounting manager,) who are the key informants of each firm. The variable measurements are followed for all variables in the conceptual model. In addition, the instrumental verifications, including the test of validity and reliability, and the statistical analyses are presented. Finally, Table 7 shows the summary of the definitions and the operational variables of constructs. The results of the hypothesis testing are revealed in the next chapter, followed by the discussion. Furthermore, the next chapter describes the response characteristics, descriptive statistics and other as well.



Table 7: Definitions and Operational Variables of Constructs

Constructs	Definitions	Operational Variables	Scale Sources
<u>Dependent Variable</u> Firm Success (FSC)	The organization's goal achievement and higher firm performance, together with the continued abilities to retain customers, the excellence of innovations and operational processes, the high competency of members, and financial position stability.	To measure the terms of growth and survive of business, the acceptance of its customers and other firms, and all performance both monetary and non-monetary are in accord with the plan, vision, mission, and goals.	New Scale
<u>Independent Variables</u> Integrated performance measurement system strategy (IPMSS)	The firm's capabilities to apply the diverse methods and metrics for tracking the overall organizational performance, monitoring the progress related to strategic objectives and action plans, allocating responsibilities, supporting the right decision-making, setting performance targets and rewarding outcomes.	Comprised of five dimensions: 1) Market value-based appraisal orientation 2) Accounting-oriented measurement capability 3) Indicator-based assessment focus 4) Value-added evaluation emphasis 5) Revenue-oriented criterion implementation	Kasie and Belay (2013), Merchant and Van der Stede (2007), Neely, Gregory and Platts (2005)

Table 7: Definitions and Operational Variables of Constructs (continued)

Constructs	Definitions	Operational Variables	Scale Sources
Market Value-Based Appraisal Orientation (MBAO)	The firm's ability to measure the market and customer performance by using a set of several market metrics for tracking marketing efficiency, expansion of market share and customer satisfaction, and providing feedback regarding the outcomes of marketing efforts.	To measure the ability of a firm in using a set of several market metrics, for tracking the marketing efficiency, the expansion of market share and the increase in customer satisfaction. The ability of the firm to use the information for inputting for further planning and decision- making.	New Scale
Accounting-Oriented Measurement Capability (AOMC)	The firm's ability to evaluate the performance of profitability, efficiency, operational costs and financial condition by depending on a set of accounting, financial, and cost metrics for providing feedback regarding the overall related financial operational performance, comparing benefits and costs of actions, and tracking budget utilization capability.	To measure the ability of a firm in depending on a set of accounting, financial and cost metrics for tracking profitability, efficiency, operation costs and financial condition. The ability of the firm to use the information for planning and controlling the budget utilization.	New Scale

Table 7: Definitions and Operational Variables of Constructs (continued)

Constructs	Definitions	Operational Variables	Scale Sources
Indicator-Based Assessment Focus (IBAF)	The firm's ability to measure the key success units of the internal business process which are linked to supplier performance and community satisfaction by relying on the set of diverse indicators for tracking overall process performance, providing feedback outcome, and using it to control all operational processes.	To measure the ability of a firm in using a set of diverse indicator to assess the key success units of internal business process, supplier performance, and community satisfaction and the firm can use information for planning and controlling operational processes.	New Scale
Value-Added Evaluation Emphasis (VAEE)	The firm's ability to assess the performance of training and development which can improve firm value and employee satisfaction; by using the set of diverse non-financial measures for tracking the enhancement of their employees' productivity and skills, innovations, and the reduction of employee turnover; and providing feedback outcomes for inputting plans and decision-making in the future.	To measure the ability of a firm in using a set of diverse non-financial measures to track the performance of the training and development that emphasize on the firm's value-added and employee satisfaction improvement. The ability of the firm to use the information for further planning and decision-making.	New Scale

Table 7: Definitions and Operational Variables of Constructs (continued)

Constructs	Definitions	Operational Variables	Scale Sources
Revenue-Oriented Criterion Implementation (ROCI)	The firm's ability to measure the performance of sales and revenue by using the set of various revenue metrics to analyze and track the revenue variance, sales growth, the increase in total revenues, and to input outcomes for sales forecast and planning in the long-term.	To measure the ability of a firm in measures the sales performance by using a diverse set of revenue metrics to analyze and track the sales variance and the sales growth. The ability of the firm to use the information for inputting for further sales forecast, planning, decision making and compel progress.	New Scale
<u>Mediating Variables</u> Sustainable Organizational Commitment (SOC)	The employees' expressive belief and attitude about the acceptance of the firm's goals and values, together with they are willing to work based on their organizational targets and plans under desiring and intending to remain with the organization forever without various rewards.	To measure employees' expressive belief and attitude about the acceptance of the organization's goals and values. To measure willingness to work based on its goals and plans under desiring and intending to remain with the organization forever without various rewards.	New Scale

Table 7: Definitions and Operational Variables of Constructs (continued)

Constructs	Definitions	Operational Variables	Scale Sources
Organizational Citizenship Behavior (OCB)	The action and behaviors of organizational members involve cooperation in operations both the in- role and extra-role behavior under the contexts of performance management system usage, including altruism, conscientiousness, sportsmanship, courtesy and civic virtue behavior.	To measure the action and behavior of employee to involve cooperation and operations.	New Scale
Continuous Organizational Loyalty (COL)	The employees' expressive efforts that consist of allegiance, respect, honesty, and dedication to the organization in the long-term, to attempt to provide positive opinions, and to encourage of their organization to outsiders.	To measure the allegiance, respect, honesty, dedication to the firm and provide the positive opinion and promoting the organization to outsiders.	New Scale
Organizational Competitiveness (OC)	The superiority of the organization when compared to other competitors in the same industry, including effective resource management, innovation, market shares, sales growth, corporate image, service quality, customer satisfaction, and productivity.	To measure to the superiority of firms with its competitors such as market shares, sales growth, corporate image, service quality, customer satisfaction, productivity, and profits.	Prasertsang and Ussahawanitchakit (2012)

Table 7: Definitions and Operational Variables of Constructs (continued)

Constructs	Definitions	Operational Variables	Scale Sources
<u>Antecedents Variables</u> Top Management Support (TMS)	The chief executives who continuously promote and push forward of developing and implementing new techniques, strategies, and methods within the organization.	Trying to the competitive strategies of the firm, agreeing with new technique and procedure implementation, perceived benefits of implementing new techniques and method, and strong, active support.	Tontiset and Ussahawanitchakit (2010)
Organizational Learning Dynamism (OLD)	The process of acquiring, creating, and developing new information and knowledge of the organization by attempting to learn from both internal and external environments that are heterogeneous, unfamiliar and changeable, together with the encouragement of sharing new knowledge and ideas among members of the organization.	To measure the firm's effort to learn from internal and external environments that learning in heterogeneous, unfamiliar, dynamic environments, sharing members' knowledge.	Chuntarung and Ussahawanitchakit (2010)



Table 7: Definitions and Operational Variables of Constructs (continued)

Constructs	Definitions	Operational Variables	Scale Sources
Best Management Accounting System (MAS)	The formal system of data collection to create and report the management accounting information within the organization to facilitate and adapt information for interpreting, planning, forecasting future events and control processes, while the collected information is accurate and reliable.	To measure to create and report the management accounting information which such information are accurate, reliable, and timely to use in interpreting, planning, and forecasting future events precisely.	New Scale
Information Technology Complementarity (ITC)	The complete progress and development of information technology to compel firms to need to select high-efficiency information technology for supporting the firm's strategy management system; and improving the efficiency of operations, productivity, and innovation.	To measure to select the high-efficiency information technology for supporting the firm's strategy management system and improving efficiency in business operations, productivity, and the firm's innovation.	New Scale

Table 7: Definitions and Operational Variables of Constructs (continued)

Constructs	Definitions	Operational Variables	Scale Sources
Competitive Environment Intensity (CEI)	The degree of business competitive severity that firms are facing, including: 1) the uncertainty of customer demand, 2) the increase of competitors in the same industry, 3) the fluctuation of product price in the marketplace, 4) the high ability of other competitors, and 5) the changing of government regulation or policy to influence firm performance and increase difficulties in business operations.	To measure the degree of intensity in the competitive environment that firms are facing, including, customer demand, the competitors in the same industry, product price fluctuation, and the change in government regulations or policies.	New Scale
<u>Moderator variable</u> Accounting Competency (AC)	The firm's accounting system to link the various sub-accounting systems together for stability, ease of use, speed, easy maintenance and efficient communication, when used combined with highly-skilled accountants.	The capacity of the accounting system to link to the subsystems of accounting and accountant's existing capacities.	New scale

Table 7: Definitions and Operational Variables of Constructs (continued)

Constructs	Definitions	Operational Variables	Scale Sources
<u>Control variables</u> Firm Age (FA)	The firm's experience measured by the period of time registered in the Stock Exchange of Thailand.	Dummy variable: 0 = less than and equal to 10 years, 1 = higher than 10 years.	-
Firm Size (FS)	Firm size is total assets measured by the total assets of the firm.	Dummy variable: 0 = the total assets of a firm are less than 10,000,000,000 baht, 1 = the total assets of a firm are equal to or more than 10,000,000,000 baht.	Goodwin-Stewart and Kent (2006)

## CHAPTER IV

### RESULTS AND DISCUSSION

The prior chapter gives details about research methods. This chapter presents respondent characteristics, sample characteristics, and correlation analysis. Secondly, the hypothesis testing and the results are detailed. The summary of all hypotheses testing is given in Table 16.

#### **Respondent Characteristics and Descriptive Statistics**

##### Respondent Characteristics

The respondents are the accounting executives (e.g. accounting director, accounting manager) who have the most comprehensive knowledge concerning firm characteristics, firm strategies, and firm performance. The characteristics of the respondents are described by the demographic characteristics, including gender, age, marital status, education level, working experience, average income per month, and current position.

The demographic characteristics of 153 respondents are as the following. Approximately 70.59 percent of respondents are female. The span of the age of respondents is 41-50 years old (39.87 percent). The majority of respondents are married (54.25 percent). Approximately, 61.44 percent is the education level, which is higher than a Bachelor's degree. Then, 62.09 percent of the respondents have working experience of more than 15 years. The average monthly income of respondents is less than 100,000 baht (46.41 percent). Finally, the majority of the respondents hold a position as the accounting manager (54.90 percent) (see Appendix C).

##### Firm Characteristics

The results of demographic characteristics of 153 Thai-listed firms indicate that the majority of the firm respondents are in the category of property and constructions (26.14 percent), technology (20.92 percent) and industrials (18.95 percent), respectively. The length of time in operating business is more than 15 years



(82.35 percent). The period of time registered in the Stock Exchange of Thailand is more than 15 years (41.83 percent). The majority of the firm respondents have authorized capitals to be less than 100,000,000 baht (60.13 percent). Moreover, the majority of the firm respondents have total assets of the firm to be less than 10,000,000,000 baht (62.09 percent). In addition, a large number of firm respondents have employees of more than 150 people (77.78 percent). The most of the firm respondents have average revenues per year to be more than 900,000,000 baht (62.09 percent) (see Appendix D for more details).

### Correlation Analysis

This research employs a bivariate correlation analysis of Pearson Correlation on all variables for two purposes. The first purpose is to explore the relationships among variables. Another purpose is to verify multicollinearity problems. A multicollinearity problem exists when the inter-correlation between independent variables exceeds 0.80 (Hair et al., 2010). In this research, the bivariate correlation procedure is subject to a two-tailed test of statistical significance at two levels, namely  $p < 0.05$  and  $p < 0.01$ . The results of the correlation analysis of all variables are shown in Table 8.

Table 8 shows that the Pearson Correlation Coefficient of the five dimensions of integrated performance measurement system strategy, including 1) market value-based appraisal orientation, 2) accounting-oriented measurement capability, 3) indicator-based assessment focus, 4) value-added evaluation emphasis, and 5) revenue-oriented criterion implementation) is between = 0.664-0.832,  $p < 0.01$ . Although a multicollinearity problem exists when inter-correlation between independent variables exceeds 0.80 (Hair et al., 2010), but correlation analysis is employed to investigate initially. Meanwhile, VIF is more related to the statistical testing of interrelationships among independent variables in each equation. The maximum value of VIF in equations 1-4 is 4.588 and is less than 10 thus multicollinearity problem is not concerned.

The five dimensions of integrated performance measurement system strategy (independent variables) have a significant and positive relationship with dependent variables, including sustainable organizational commitment, organizational citizenship behavior, continuous organizational loyalty, and organizational competitiveness ( $r = 0.598-0.745$ ,  $p < 0.01$ ). For the antecedents, these variables are significantly related



to each of five dimensions of integrated performance measurement system strategy ( $r = 0.646-0.805$ ,  $p < 0.01$ ). Moreover, the moderating effect of accounting competency has correlations with all antecedent variables and five dimensions of IPMSS between  $0.669-0.808$ ,  $p < 0.01$ . Moreover, the correlations among all variables in the conceptual model are in the range of  $r = 0.583-0.892$ ,  $p < 0.01$ ; but there are some relationships of variables that both correlations coefficient are higher than 0.8, which may cause of multicollinearity problems was concerned, such as the relationship between indicator-based assessment focus and value-added evaluation emphasis ( $r = 0.832$ ,  $p < 0.01$ ), sustainable organizational commitment and organizational citizenship behavior ( $r = 0.875$ ,  $p < 0.01$ ), sustainable organizational commitment and continuous organizational loyalty ( $r = 0.880$ ,  $p < 0.01$ ), organizational citizenship behavior and continuous organizational loyalty ( $r = 0.892$ ,  $p < 0.01$ ), top management support and organizational learning dynamism ( $r = 0.856$ ,  $p < 0.01$ ), organizational learning dynamism and information technology complementarity ( $r = 0.810$ ,  $p < 0.01$ ), best management accounting system and information technology complementarity ( $r = 0.877$ ,  $p < 0.01$ ), and competitive environment intensity and accounting competency ( $r = 0.808$ ,  $p < 0.01$ ). Meanwhile, VIF is more related to the statistical testing of interrelationships among independent variables in each equation. The maximum value of VIF in Equations 7-16 is 8.919 and is less than 10. Therefore, multicollinearity problems are irrelevant.



Table 8: Descriptive Statistics and Correlation Matrix of Integrated Performance Measurement System Strategy and all Constructs

Variables	MBAO	AOMC	IBAF	VAEE	ROCI	SOC	OCB	COL	OC	FSC	TMS	OLD	MAS	ITC	CEI	AC	FA	FS
Mean	4.11	4.41	4.20	4.16	4.26	4.09	4.08	4.09	3.99	4.08	4.27	4.25	4.35	4.29	4.33	4.41	n/a	n/a
S.D.	0.71	0.55	0.62	0.65	0.58	0.69	0.66	0.64	0.76	0.70	0.61	0.62	0.59	0.66	0.58	0.56	n/a	n/a
MBAO	1																	
AOMC	.664***	1																
IBAF	.759***	.765***	1															
VAEE	.733***	.716***	.832***	1														
ROCI	.708***	.729***	.754***	.764***	1													
SOC	.656***	.639***	.666***	.701***	.598***	1												
OCB	.696***	.632***	.725***	.726***	.690***	.875***	1											
COL	.679***	.634***	.695***	.719***	.637***	.880***	.892***	1										
OC	.745***	.678***	.743***	.718***	.717***	.763***	.799***	.793***	1									
FSC	.697***	.660***	.652***	.689***	.695***	.764***	.768***	.802***	.877***	1								
TMS	.739***	.755***	.774***	.756***	.710***	.771***	.699***	.752***	.792***	.777***	1							
OLD	.731***	.768***	.805***	.773***	.746***	.775***	.764***	.798***	.788***	.778***	.856***	1						
MAS	.672***	.757***	.753***	.782***	.711***	.707***	.691***	.705***	.755***	.734***	.759***	.779***	1					
ITC	.652***	.732***	.740***	.750***	.688***	.686***	.698***	.711***	.743***	.726***	.752***	.810***	.877***	1				
CEI	.646***	.652***	.756***	.693***	.708***	.615***	.709***	.667***	.776***	.670***	.713***	.748***	.731***	.741***	1			
AC	.669***	.707***	.749***	.718***	.712***	.583***	.646***	.640***	.707***	.646***	.710***	.758***	.707***	.689***	.808***	1		
FA	.034	.013	.020	-.008	.070	.046	-.012	-.010	.074	.026	.098	.051	-.037	-.012	.125	.119	1	
FS	.149	.103	.087	.171**	.138	.168**	.091	.133	.209***	.196**	.159**	.188**	.146	.168**	.095	.156	.126	1

\*\*\* Correlation is significant at the 0.01 level (2-tailed), \*\* Correlation is significant at the 0.05 level (2-tailed).

## Hypotheses Testing and Results

This research uses the Ordinary Least Squares (OLS) regression to investigate the hypothesized relationships. Moreover, the regression equations are the linear combination of the best independent variables to explain and predict the dependent variable of each equation. Furthermore, firm age and firm size are two dummy variables that are included in testing all equations. There are sixteen equations in this research. The results of descriptive statistics and hypotheses testing are discussed according to regression equations as follows:

### The Effects of Integrated Performance Measurement System Strategy on Its Consequences

Figure 7 shows the effect of integrated performance measurement system strategy on its consequences which are proposed in Hypotheses 1(a-d)-5(a-d). The relationship in each hypothesis is proposed in a positive relationship direction. These hypotheses can be transformed into the regression equation in Models 1 to 4.

Figure 7: Results of the Effects of Integrated Performance Measurement System Strategy on Sustainable Organizational Commitment, Organizational Citizenship Behavior, Continuous Organizational Loyalty on Organizational Competitiveness

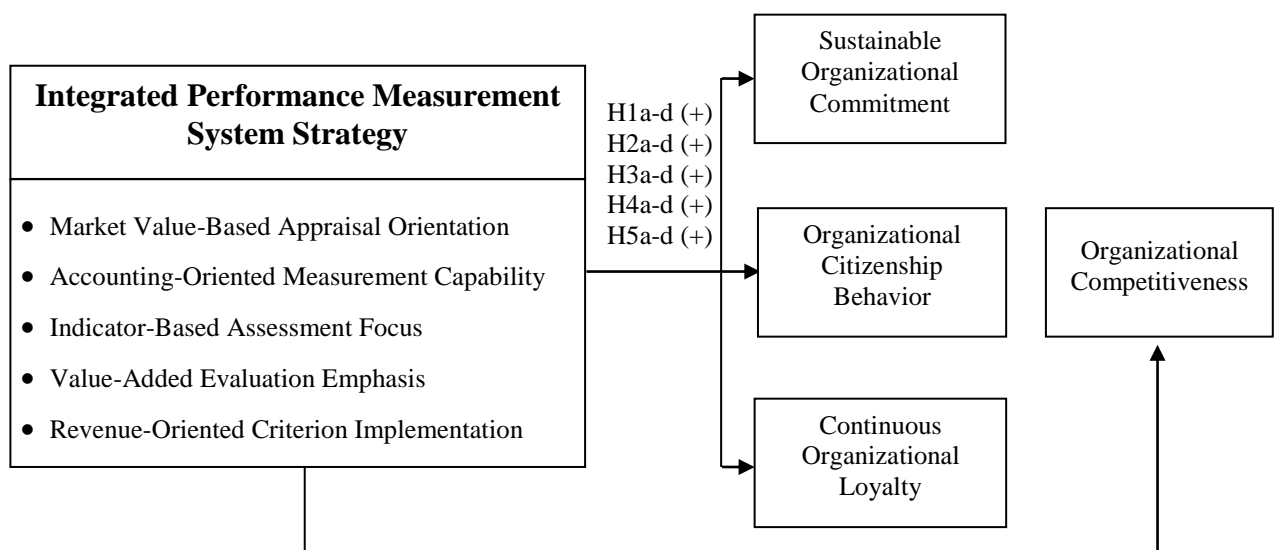




Table 9 presents the correlation coefficients among each dimension of the integrated performance measurement system strategy and its consequences, including sustainable organizational commitment, organizational citizenship behavior, continuous organizational loyalty, and organizational competitiveness. For the first dimension of integrated performance measurement system strategy (IPMSS), the results identify the positive correlation between market value-based appraisal orientation and sustainable organizational commitment ( $r = 0.656, p < 0.01$ ), organizational citizenship behavior ( $r = 0.696, p < 0.01$ ), continuous organizational loyalty ( $r = 0.679, p < 0.01$ ), and organizational competitiveness ( $r = 0.745, p < 0.01$ ). For the second dimension of IPMSS, accounting-oriented measurement capability is significantly and positively correlated to sustainable organizational commitment ( $r = 0.639, p < 0.01$ ), organizational citizenship behavior ( $r = 0.632, p < 0.01$ ), continuous organizational loyalty ( $r = 0.634, p < 0.01$ ), and organizational competitiveness ( $r = 0.678, p < 0.01$ ). For the third dimension of IPMSS, indicator-based assessment focus is significantly and positively correlated to sustainable organizational commitment ( $r = 0.666, p < 0.01$ ), organizational citizenship behavior ( $r = 0.725, p < 0.01$ ), continuous organizational loyalty ( $r = 0.695, p < 0.01$ ), and organizational competitiveness ( $r = 0.743, p < 0.01$ ). For the fourth dimension of IPMSS, value-added evaluation emphasis has a significant correlation with sustainable organizational commitment ( $r = 0.701, p < 0.01$ ), organizational citizenship behavior ( $r = 0.726, p < 0.01$ ), continuous organizational loyalty ( $r = 0.719, p < 0.01$ ), and organizational competitiveness ( $r = 0.718, p < 0.01$ ). For the fifth dimension of IPMSS, revenue-oriented criterion implementation has a significant and positive correlation with sustainable organizational commitment ( $r = 0.598, p < 0.01$ ), organizational citizenship behavior ( $r = 0.690, p < 0.01$ ), continuous organizational loyalty ( $r = 0.637, p < 0.01$ ), and organizational competitiveness ( $r = 0.717, p < 0.01$ ). From the findings in Table 9, all correlations are less than 0.80 as recommended by Hair et al. (2010). In addition to the correlations, Table 10 also points out the maximum value of VIF (Equations 1-4) is 4.588, which is lower than the cutoff score of 10 (Hair et al., 2010). Both correlations and the variance inflation factor (VIF) ensure the non-existence of multicollinearity problems.



Table 9: Descriptive Statistics and Correlation Matrix of Integrated Performance Measurement System Strategy and Its Consequences

Variables	MBAO	AOMC	IBAF	VAEE	ROCI	SOC	OCB	COL	OC	FA	FS
Mean	4.11	4.41	4.20	4.16	4.26	4.09	4.08	4.09	3.99	n/a	n/a
Standard Deviation	0.71	0.55	0.62	0.65	0.58	0.69	0.66	0.64	0.76	n/a	n/a
Market Value-Based Appraisal Orientation (MBAO)	1										
Accounting-Oriented Measurement Capability (AOMC)	.664***	1									
Indicator-Based Assessment Focus (IBAF)	.759***	.765***	1								
Value-Added Evaluation Emphasis (VAEE)	.733***	.716***	.832***	1							
Revenue-Oriented Criterion Implementation (ROCI)	.708***	.729***	.754***	.764***	1						
Sustainable Organizational Commitment (SOC)	.656***	.639***	.666***	.701***	.598***	1					
Organizational Citizenship Behavior (OCB)	.696***	.632***	.725***	.726***	.690***	.875***	1				
Continuous Organizational Loyalty (COL)	.679***	.634***	.695***	.719***	.637***	.880***	.892***	1			
Organizational Competitiveness (OC)	.745***	.678***	.743***	.718***	.717***	.763***	.799***	.793***	1		
Firm Age (FA)	.034	.013	.020	-.008	.070	.046	-.012	-.010	.074	1	
Firm Size (FS)	.149	.103	.087	.171**	.138	.168**	.091	.133	.209***	.126	1

\*\*\* Correlation is significant at the 0.01 level (2-tailed), \*\* Correlation is significant at the 0.05 level (2-tailed).

The results of OLS regression analysis are explained in Table 10. Firstly, the result indicates that market value-based appraisal orientation (the first dimension) positively influences all four outcomes: sustainable organizational commitment ( $\beta_1 = 0.234$ ,  $p < 0.05$ ), organizational citizenship behavior ( $\beta_8 = 0.229$ ,  $p < 0.01$ ), continuous organizational loyalty ( $\beta_{15} = 0.243$ ,  $p < 0.01$ ), and organizational competitiveness ( $\beta_{22} = 0.307$ ,  $p < 0.01$ ).

In terms of market value-based appraisal orientation, and according to Clark, Abela and Ambler (2006), it can provide feedback outcome regarding marketing efforts. It has an important role and is used by firms to review whether the intended strategy has been implemented and communicated to employees “what are the goals of the firm” to be expected to achieve (Lamberti and Noci, 2010). When a firm’s employees recognize and accept organizational goals and are willing to exert effort on an organization’s behalf, it is a characteristic of strong organizational commitment (Bridges and Harrison, 2003; Colbert and Kwon, 2000). This is consistent with the result of O’Sullivan, Abela and Hutchinson (2009) and Burney and Swanson (2010) who found that market value-based appraisal orientation can increase firm performance, managers’ job satisfaction, and CEO satisfaction. It can improve the efficiency of decision-making (Morgan, Clark and Gooner, 2002). The firms that orient market value-based appraisal to be one part of performance measurement system are likely to earn higher organizational performance through employees’ attitudes and behaviors within the organization (Davis and Albright, 2004). It gains higher organizational commitment and enhances the job performance of employees (Lau and Moser, 2008). Moreover, the firms can reduce ambiguity and conflict of an employee by using strategic performance measurement systems that are appropriate to the situation of the organization (Burney and Widener, 2007). Likewise, the study of Rompho and Siengthai (2012) found that a comprehensive set of performance measures positively relate to employee satisfaction and work-related competencies. Furthermore, firms that can connect the system of market value-based appraisal with the compensation contract together help employees’ attention and motivate behavior to become aligned with organizational goals, and also positively affect employees’ organizational citizenship behaviors (Burney, Henle and Widener, 2009). Moreover, market value-based appraisal orientation has become a form of organizational control that incorporates formalized routines and procedures that use the



information to maintain or alter goal-oriented patterns in organizational activity (Morgan, Clark and Gooner, 2002). Firms that continuously follow up the performance of customer satisfaction are likely to increase financial performance and enhance the reputation of the organization (Ittner and Larcker, 1998; Neely, Gregory and Platts, 2005, Van der Stede, Chow and Lin, 2006). Besides, the study of Bhatti, Awan and Razaq (2014) and Kasie and Belay (2013) also found that the firms which measure their performance of customers and markets achieve better business performance. Similarly, Clark and Ambler (2001) state that market value-based appraisal increases organizational competitiveness. **Thus, Hypotheses 1a, 1b, 1c and 1d are strongly supported.** Summarily, the higher the market value-based appraisal orientation is, the more likely that a firm will gain greater (a) sustainable organizational commitment, (b) organizational citizenship behavior, (c) continuous organizational loyalty, and (d) organizational competitiveness.

Secondly, the result finds that accounting-oriented measurement capability (the second dimension) has a positive effect on sustainable organizational commitment ( $\beta_2 = 0.212, p < 0.05$ ). This is consistent with Schneider et al. (2003) who found that financial performance measures propel employees' attitudes, and increase overall job satisfaction of employees. Afterward, Johnson, Davis and Albright (2009) expanded the study of Schneider et al. (2003), and they found that accounting-oriented measurement capability has a positive impact on employee attitudes, such as job satisfaction, pay satisfaction, organizational commitment, and organizational justice. Besides, firms that have a well-designed performance measurement system strategy will change employees' behavior and automatically lead to improving a firm's staff performance (Robson, 2005). **Thus, Hypothesis 2a is supported.** Briefly, the higher the accounting-oriented measurement capability is, the more likely that a firm will gain greater sustainable organizational commitment.

However, these results do not find the significant effects of accounting-oriented measurement capability on organizational citizenship behavior, continuous organizational loyalty, and organizational competitiveness. It is possible that the firm's accounting-oriented measurement capability is considered as the measurement of a number or money, more than the quality or performance of employees and that its influences may not reach to employees' deep psychological states (e.g. citizenship



behavior and loyalty). This is consistent with Johnson and Kaplan (1987) and Khan and Shah (2011) who concluded and criticized that accounting-oriented measurement alone is not sufficient to measure the overall performance of the organization. Thus, firms should design a new performance measurement system strategy that includes financial and non-financial measures together (Gosselin, 2005). It is consistent with the study of Van der Stede, Chow and Lin (2006) who found that financial measurement has no relationships with firm performance. Moreover, the investigation of Kasie and Belay (2013) found that finance and accounting measures which are included in the performance measurement system strategy do not affect other business performance (profit margin, sales growth, revenue) and labor productivity. It implies that the influence of accounting-oriented measurement capability may just overcome the ability of firms to generate some quantitative data to react to the needs of executives only. The financial information alone is recognized by the organization that may lead to the perspective of employees about the unfairness in a performance measurement to follow. ***Thus, Hypotheses 2b, 2c, and 2d are not supported.***

Thirdly, OLS regression results support that indicator-based assessment focus (the third dimension) has a positive impact on two consequences as organizational citizenship behavior ( $\beta_{10} = 0.194$ ,  $p < 0.10$ ) and organizational competitiveness ( $\beta_{24} = 0.207$ ,  $p < 0.05$ ). This is consistent with Bhatti, Awan and Razaq (2014) who stated that a firm's indicator-based assessment focus establishes and continuously improves firm success and performance. Moreover, the study of Van der Stede, Chow and Lin (2006) identified that firms which use both objective non-financial measures (i.e. internal operating-oriented, employee-oriented, and customer-oriented) and subjective financial measures in the performance measurement system can increase higher firm performance than other firms. Besides, the result of Kasie and Belay (2013) can confirm this research that the performance measurement system which focuses on process/operation measures, social measures, and supplier partnership performance, improve better organizational competitiveness and performance. Furthermore, when firms can link performance measurement system with compensation contracts, all employees' attention and behaviors are consistent with organizational goals. Moreover, there are positive impacts on employees' organizational citizenship behaviors through the perspective of procedural justice (Burney, Henle and Widener, 2009). It may be



possible that IPMSS enhances firm success through its relations with job-relevant information and lower levels of ambiguity and conflict of employees (Burney and Widener, 2007; Hall, 2008). **Thus, Hypotheses 3b and 3d are supported.** Summarily, the higher the indicator-based assessment focus is, the more likely that a firm will gain greater organizational citizenship behavior and organizational competitiveness.

However, this research does not find a significant effect of indicator-based assessment focus on sustainable organizational commitment and continuous organizational loyalty. The possible explanation of these relationships is relevant to the phenomenon of performance measurement to be used by the organizations to ensure whether they are making the right decision or not. Indicators are used to evaluate overall business operations to lead to outcomes compare with other organizations in the same industry, plants, and departments of their firm only (Ghalayini and Noble, 1996; Mapes and Szwejczewski, 1997). On the other hand, when firms select indicators that do not fit the style of operations, or set unclear goals and exceed one's ability, it may have the effect on employee behavior and is not accepted by their employees, and organizational commitment and loyalty may likely change from positive to negative (Parmenter, 2009). **Thus, Hypotheses 3a and 3c are not supported.**

Fourthly, the results indicate that value-added evaluation emphasis (the fourth dimension) has a positive effect on three outcomes: sustainable organizational commitment ( $\beta_4 = 0.355$ ,  $p < 0.01$ ), organizational citizenship behavior ( $\beta_{11} = 0.241$ ,  $p < 0.05$ ), and continuous organizational loyalty ( $\beta_{18} = 0.320$ ,  $p < 0.01$ ). The empirical studies support that continuously measuring and tracking the performance of training and development are to give a competitive advantage of the organization over their competitors (Taylor and Baines, 2012). The successes of the organizations are entirely dependent on the employee's productivity and performance. Particularly, tracking and evaluating employee satisfaction is the key success factor for every organization (Bhatti, Awan and Razaq, 2014). When the employees are satisfied, then they will make their customers feel satisfied as well, and the increase of organizational performance (Leong, Snyder and Ward, 1990; Mapes and Szwejczewski, 1997). Besides, integrated performance measurement system strategy has a positive association with employee commitment (Bart, 2001). The result is consistent with the study of Lee and Yang (2011) who found that firms which measure to focus on the perspective of innovation



and learning growth have positively associated with firm performance. Moreover, Burney and Swanson (2010) identified that the performance measurement of learning and growth is a key factor, and there is a significant, positive relationship between a firm's ability to link performance measures to strategy and managers' job satisfaction. Robson (2005) found that a well-designed performance measurement system can change employee behavior and automatically lead to improving a staff's performance. **Thus, Hypotheses 4a, 4b and 4c are supported.** Consequently, the higher the value-added evaluation emphasis is, the more likely that a firm will gain greater (a) sustainable organizational commitment, (b) organizational citizenship behavior, and (c) continuous organizational loyalty.

However, this research does not find a significant influence on organizational competitiveness. It is possible that firms emphasize the creation of activities to training and development too much cause employees are unable to work during the training time. Besides, the value-added evaluation emphasis of the firm often focuses on the success of the performance of training and development to track enhancing employees' productivity and skill so the firm may need to spend much money to invest in these activities, resulting in a loss of investment in order to increase the competitiveness of the organization. This is consistent with the research of Chen, Cheng and Hwang (2005) who found that tracking the performance of training and development has a positive impact on market value and financial performance, but it may not be clear in the year that invests. Therefore, a firm should evaluate and track the performance of training and development of employees and employee satisfaction continuously, because it may increase competitiveness in the following year. **Thus, Hypothesis 4d is not supported.**

Finally, the research reveals that revenue-oriented criterion implementation positively and significantly affects organizational citizenship behavior ( $\beta_{12} = 0.181$ ,  $p < 0.05$ ), and organizational competitiveness ( $\beta_{26} = 0.180$ ,  $p < 0.05$ ). It is believed that when firms are oriented to measure their performance to follow the suitable revenue measurement criterion, it can change to provide higher organizational citizenship behavior and competitiveness. It corresponds with the prior research that indicates revenue measures are the financial measures, which are implemented to track and evaluate the revenue variance and the sales growth of the organizations (Bititci et al., 2009). It provides both feedback regarding the outcomes of the overall marketing and





applies for further planning and decision-making (Clark, Abela and Ambler, 2006; Morgan, Clark, and Gooner, 2002). Moreover, Parmenter (2009) suggests that sales, sales by product, and sales growth rate are as the key financial measures to assess and track firm performance. The empirical evidence of O'Sullivan, Abela and Hutchinson (2009) found that the ability of performance measurement system, based on a revenue-oriented criterion, has a positive impact on the firm's performance and organizational citizenship behaviors (Burney, Henle and Widener, 2009). The study of Bhatti, Awan and Razaq (2014) found that tracking financial performance such as sales, sales by product, and sales growth rate positively affects the overall performance of organizations. **Thus, Hypotheses 5b and 5d are supported.** Accordingly, the higher the revenue-oriented criterion implementation is, the more likely that a firm will gain greater (b) organizational citizenship behavior and (d) organizational competitiveness.

However, revenue-oriented criterion implementation does not significantly affect sustainable organizational commitment and continuous organizational loyalty. It may result from focusing excessively on the revenue-oriented criterion in performance measurement system of a firm which may contribute to resistance from their employees to change. This may negatively affect their organizational commitment (Ahmed, Khushi and Islam, 2013). Employees who are not committed to a firm are likely to have less organizational loyalty as well. **Thus, Hypotheses 5a and 5c are not supported.**

Additionally, the results of control variables indicate that firm age and firm size are not related to four consequents of the integrated performance measurement system strategy, excluding the result of Equation 4 which finds that firm size has a positive impact on organizational competitiveness ( $\beta_{33} = 0.183, p < 0.10$ ). Therefore, it can be interpreted that a longer period of time registered on the Stock Exchange of Thailand, and higher total assets, do not significantly affect the level of sustainable organizational commitment, organizational citizenship behavior and continuous organizational loyalty. However, firm size has a direct influence on organizational competitiveness only. It shows that Thai-listed firms represent a large firm which has sufficient resources and higher capacities to use a variety of measures to track their performance and generate organizational competitiveness is higher than other firms that are not registered in SET. Moreover, the study of Marc et al. (2010) found that a large firm is normally associated with the better ability of resource allocation and competitiveness.





Table 10: Results of the Regression Analysis for the Effects of Integrated Performance Measurement System Strategy on Its Consequences

Independent Variables	Dependent Variables			
	SOC	OCB	COL	OC
	Equation 1	Equation 2	Equation 3	Equation 4
<b>Integrated Performance Measurement System Strategy:</b>				
Market Value-Based Appraisal Orientation (MBAO: H1a-d)	<b>.234**</b> (.091)	<b>.229***</b> (.085)	<b>.243***</b> (.089)	<b>.307***</b> (.079)
Accounting-Oriented Measurement Capability (AOMC: H2a-d)	<b>.212**</b> (.092)	.030 (.086)	.120 (.090)	.112 (.080)
Indicator-Based Assessment Focus (IBAF: H3a-d)	.066 (.118)	<b>.194*</b> (.110)	.119 (.115)	<b>.207**</b> (.102)
Value-Added Evaluation Emphasis (VAEE: H4a-d)	<b>.355***</b> (.111)	<b>.241**</b> (.104)	<b>.320***</b> (.108)	.088 (.096)
Revenue-Oriented Criterion Implementation (ROCI: H5a-d)	-.052 (.098)	<b>.181**</b> (.091)	.043 (.095)	<b>.180**</b> (.084)
<b>Control Variables:</b>				
Firm Age (FA)	.070 (.113)	-.064 (.105)	-.050 (.110)	.071 (.098)
Firm Size (FS)	.098 (.117)	-.053 (.109)	.033 (.114)	<b>.183*</b> (.101)
<b>Adjusted R<sup>2</sup></b>	<b>.539</b>	<b>.599</b>	<b>.563</b>	<b>.656</b>
<b>Maximum VIF</b>	<b>4.588</b>	<b>4.588</b>	<b>4.588</b>	<b>4.588</b>

\*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.10

Beta coefficients with standard errors in parenthesis

The Effects of Sustainable Organizational Commitment, Organizational Citizenship Behavior, Continuous Organizational Loyalty, and Organizational Competitiveness on Firm Success

According to Figure 8, the relationships among sustainable organizational commitment, organizational citizenship behavior, continuous organizational loyalty, organizational competitiveness and firm success are shown. This research proposes that sustainable organizational commitment, organizational citizenship behavior, continuous organizational loyalty, and organizational competitiveness have an effect on firm success in positive directions (Hypotheses 6-9). These hypotheses are transformed into regression equations 5 and 6.



Figure 8: Results of the Effects of Integrated Performance Measurement System Strategy Consequents on Firm Success

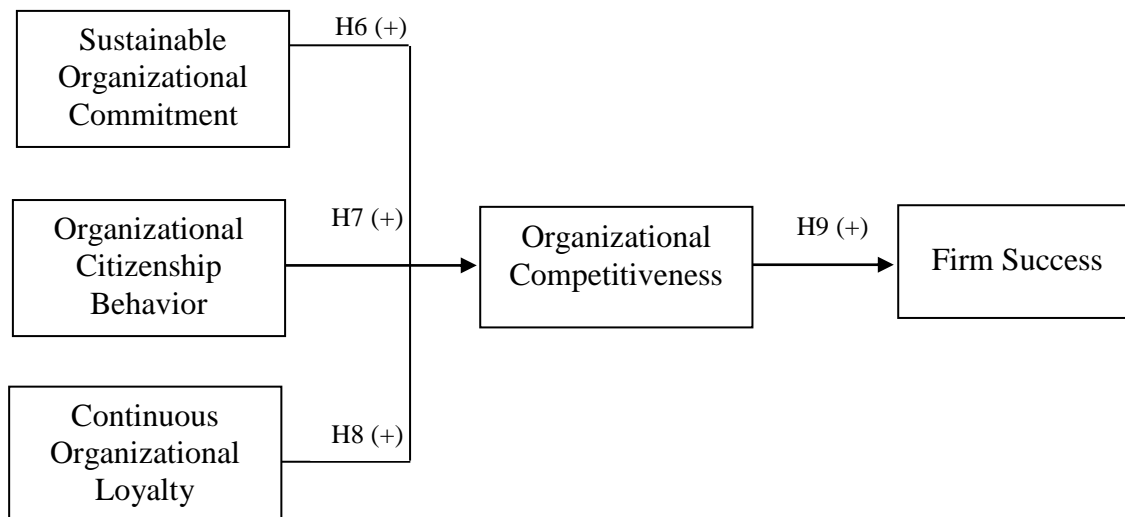


Table 11 illustrates correlations among sustainable organizational commitment, organizational citizenship behavior, continuous organizational loyalty, organizational competitiveness and firm success. The results show the positive correlation between sustainable organizational commitment and organizational competitiveness ( $r = 0.763$ ,  $p < 0.01$ ). Similarly, organizational citizenship behavior has a significant and positive correlation with organizational competitiveness ( $r = 0.799$ ,  $p < 0.01$ ). Continuous organizational loyalty has a significant and positive correlation with organizational competitiveness ( $r = 0.793$ ,  $p < 0.01$ ). Moreover, organizational competitiveness has a significant and positive correlation with firm success ( $r = 0.877$ ,  $p < 0.01$ ). From the findings in Table 11, the correlations are less than 0.80 as recommended by Hair et al. (2010), exceeding the relationship between organizational competitiveness and firm success. In addition to the correlations, Table 12 also suggests the maximum value of VIF is 6.233 in Equation 5, and 1.048 in Equation 6, which is lower than the cut-off score of 10 (Hair et al., 2010). Both correlations and the VIF ensure the non-existence of multicollinearity problems.



Table 11: Descriptive Statistics and Correlation Matrix of Integrated Performance Measurement System Strategy Consequents and Firm Success

Variables	SOC	OCB	COL	OC	FSC	FA	FS
Mean	4.09	4.08	4.09	3.99	4.08	n/a	n/a
Standard Deviation	0.69	0.66	0.64	0.76	0.70	n/a	n/a
Sustainable Organizational Commitment (SOC)	1						
Organizational Citizenship Behavior (OCB)	.875***	1					
Continuous Organizational Loyalty (COL)	.880***	.892***	1				
Organizational Competitiveness (OC)	.763***	.799***	.793***	1			
Firm Success (FSC)	.764***	.768***	.802***	.877***	1		
Firm Age (FA)	.046	-.012	-.010	.074	.026	1	
Firm Size (FS)	.168**	.091	.133	.209***	.196**	.126	1

\*\*\* Correlation is significant at the 0.01 level (2-tailed),

\*\* Correlation is significant at the 0.05 level (2-tailed).

For the hypothesis testing, the results of OLS regression analysis are identified in Table 12. Surprisingly, it is found that sustainable organizational commitment does not affect organizational competitiveness significantly. The possible explanations for the findings are that organizational commitment is seen as a consequence of personal interaction with a firm and is more likely to relate to the expression of individuality and differentiation. This is consistent with the research of Waitip, Janjarasjit and Raksong (2015) who found that organization commitment awareness cannot affect organizational competitiveness. Moreover, the empirical evidence of Yiing and Ahmad (2009) found that organizational commitment does not associate with the job performance of the firm. Thus, employees' expressive belief and attitude about the acceptance of a firm's goals and values, and a willingness to work based on its goals, cannot increase organizational competitiveness. **Therefore, Hypothesis 6 is not supported.**

Other results indicate that organizational citizenship behavior has a positive impact on organizational competitiveness ( $\beta_{30} = 0.431$ ,  $p < 0.01$ ). The finding is consistent with Alizadeh et al. (2012) who indicated that a high-level of organizational citizenship behavior has an important role that causes enhancement of organizational



competitiveness. It shows that the good behavior of the organization's members support the improvement of organizational performance, firm value and firm success (Kittikunchotiwut and Ussahawanitchakit, 2012; Pragoddee and Ussahawanitchakit, 2013), and lead to higher market share achievement (Noble, Sinha and Kumar, 2002). The study of Podsakoff and Mackenzie (1997) found that organizational citizenship behavior increases firm value. Moreover, Kataria, Garg and Rastogi (2013) found that organizational citizenship behavior has significant, positive effects on organizational performance and organizational effectiveness. Besides, Podsakoff et al. (2009) indicate that organizational citizenship behavior positively affects organizational effectiveness that is measured by unit productivity, efficiency, profitability and cost reduction. Finally, organizational citizenship behavior has a positive and significant relationship with customer-orientation as a proper competitive advantage (Van Dyne, Graham and Dienesch, 1994). **Thus, Hypothesis 7 is strongly supported.** Consequently, the higher the organizational citizenship behavior is, the more likely that a firm will gain greater organizational competitiveness.

This interesting finding indicates that continuous organizational loyalty has a strong and positive effect on organizational competitiveness ( $\beta_{31} = 0.327$ ,  $p < 0.01$ ). The finding is consistent with Antoncic and Antoncic (2011) who found that employee loyalty helps provide greater efficiency, better firm outcomes, firm growth, and reduction of employee turnover to achieve business objectives and organizational growth. It implies that continuous organizational loyalty plays in improving the firm's performance (Elegido, 2013). Moreover, the study of Waitip, Janjarasjit and Raksong (2015) found that there is a positive relationship between organizational loyalty concern and competitiveness. Therefore, when a firm has organizational loyalty, the firm is promoted by their employees to outsiders, and their employees will protect and defend it against external threats, and remain with the organization every circumstance (Organ, Podsakoff and MacKenzie, 2006). **Thus, Hypothesis 8 is supported.** Consequently, the higher the continuous organizational loyalty is, the more likely that a firm will gain greater organizational competitiveness.

The finding indicates that organizational competitiveness has a strong and positive effect on firm success ( $\beta_{34} = 0.877$ ,  $p < 0.01$ ). This finding is consistent with Bharadwaj and Menon (2000) and Porter (1985) who stated that organizational



competitiveness positively affects firm success and survival. Ordinarily, organizational competitiveness plays an important role to improve firm performance, both market shares, sales growth, and other performance (Testa, Iraldo and Frey, 2011). The study of Prasertsang, Ussahawanitchakit and Jhundra-indra (2012) found that organizational competitiveness enhances and improves firm success as a result of the implementation of the new strategy and product innovation, leading to access new markets and a firm's superior success. This indicates that stronger competitiveness leads to higher levels of success through the development of the optimal dynamic capabilities within the firms. ***Thus, Hypothesis 9 is strongly supported.***

Additionally, the results of the control variables indicate that firm size has a positive effect on organizational competitiveness ( $\beta_{28} = 0.215, p < 0.05$ ). Thus, the larger firms may earn a higher organizational competitiveness (Marc et al., 2010). Due to Thai-listed firms which are generally selected from the database of the Stock Exchange represent a large firm in Thailand, they have sufficient resources and higher capacities to track their performance and improve organizational competitiveness greater than a small firm which is generally company limited. On the other hand, Firm age does not affect organizational competitiveness and firm success. It shows that the firm's experience both in the short and long-term under environmental uncertainty cannot increase the very opportunities in management, organizational competitiveness, and firm success.



Table 12: Results of Regression Analysis for the Effects of Integrated Performance Measurement System Strategy Consequents on Firm Success

Independent Variables	Dependent Variables	
	OC	FSC
	Equation 5	Equation 6
Sustainable Organizational Commitment (SOC: H6)	.078 (.108)	
Organizational Citizenship Behavior (OCB: H7)	<b>.431***</b> (.113)	
Continuous Organizational Loyalty (COL: H8)	<b>.327***</b> (.115)	
Organizational Competitiveness (OC: H9)		<b>.877***</b> (.040)
<b>Control Variables:</b>		
Firm Age (FA)	.133 (.094)	-.084 (.080)
Firm Size (FS)	<b>.215**</b> (.097)	.037 (.083)
<b>Adjusted R<sup>2</sup></b>	<b>.679</b>	<b>.767</b>
<b>Maximum VIF</b>	<b>6.233</b>	<b>1.048</b>

\*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.10

Beta coefficients with standard errors in parenthesis

#### The Effect of the Antecedents of Integrated Performance Measurement System Strategy, and the Moderating Role of Accounting Competency

Figure 9 shows the relationships among five antecedents: top management support, organizational learning dynamism, best management accounting system, information technology complementarity, and competitive environment intensity with five dimensions of integrated performance measurement system strategy; and it proposes Hypotheses 10 (a-e) – 14 (a-e). The relationship in each hypothesis is proposed in a positive direction. These hypotheses can be transformed into the regression equation in Models 7, 8, 9, 10 and 11. In addition, the moderating role of accounting competency is proposed to positively influence the relationships among all antecedents and each dimension of integrated performance measurement system strategy by being presented in Hypotheses 15(a-e)-19(a-e). According to these hypotheses, regression equations in Models 12, 13, 14, 15 and 16 are developed.



Figure 9: Results of the Effects of Antecedents on Integrated Performance Measurement System Strategy

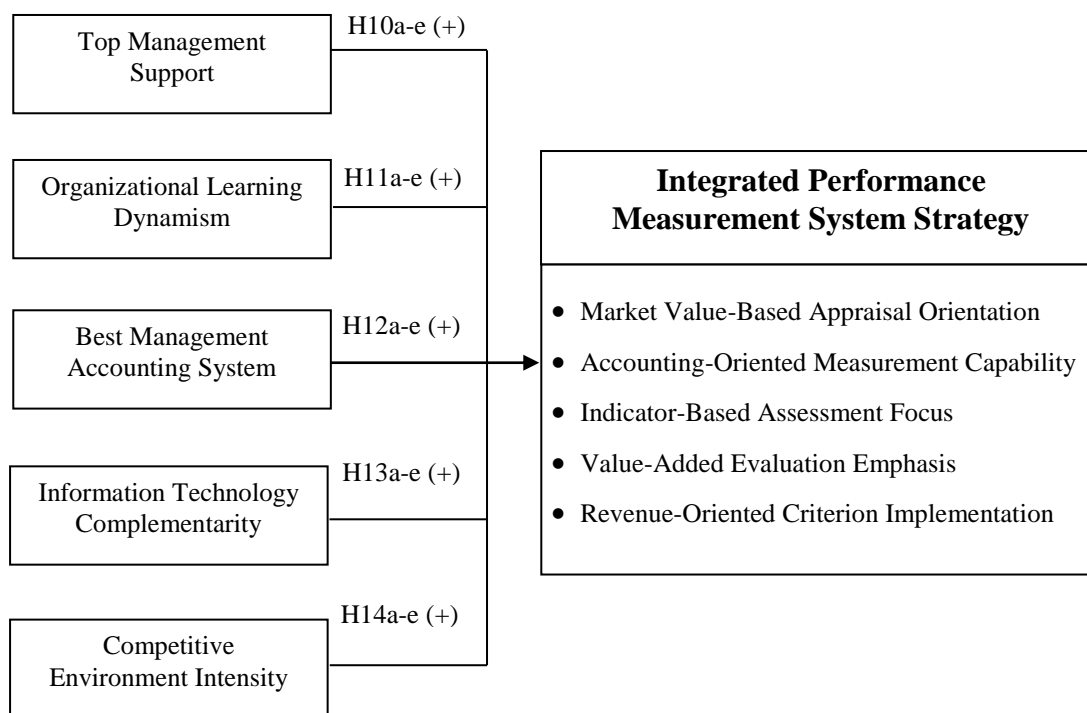


Table 13 is shown to describe the correlations among top management support, organizational learning dynamism, best management accounting system, information technology complementarity, competitive environment intensity, and each dimension of integrated performance measurement system strategy (IPMSS). In details, it seems that all antecedents have a positive correlation with all dimensions of IPMSS. Firstly, top management support correlates with market value-based appraisal orientation ( $r = 0.739$ ,  $p < 0.01$ ), accounting-oriented measurement capability ( $r = 0.755$ ,  $p < 0.01$ ), indicator-based assessment focus ( $r = 0.774$ ,  $p < 0.01$ ), value-added evaluation emphasis ( $r = 0.756$ ,  $p < 0.01$ ), and revenue-oriented criterion implementation ( $r = 0.710$ ,  $p < 0.01$ ). Secondly, organizational learning dynamism correlates with market value-based appraisal orientation ( $r = 0.731$ ,  $p < 0.01$ ), accounting-oriented measurement capability ( $r = 0.768$ ,  $p < 0.01$ ), indicator-based assessment focus ( $r = 0.805$ ,  $p < 0.01$ ), value-added evaluation emphasis ( $r = 0.773$ ,  $p < 0.01$ ), and revenue-oriented criterion implementation ( $r = 0.746$ ,  $p < 0.01$ ). Thirdly, best management accounting system has



a positive correlation with market value-based appraisal orientation ( $r = 0.672$ ,  $p < 0.01$ ), accounting-oriented measurement capability ( $r = 0.757$ ,  $p < 0.01$ ), indicator-based assessment focus ( $r = 0.753$ ,  $p < 0.01$ ), value-added evaluation emphasis ( $r = 0.782$ ,  $p < 0.01$ ), and revenue-oriented criterion implementation ( $r = 0.711$ ,  $p < 0.01$ ). Fourthly, information technology complementarity has a positive correlation with market value-based appraisal orientation ( $r = 0.652$ ,  $p < 0.01$ ), accounting-oriented measurement capability ( $r = 0.732$ ,  $p < 0.01$ ), indicator-based assessment focus ( $r = 0.740$ ,  $p < 0.01$ ), value-added evaluation emphasis ( $r = 0.750$ ,  $p < 0.01$ ), and revenue-oriented criterion implementation ( $r = 0.688$ ,  $p < 0.01$ ). Finally, competitive environment intensity has a positive correlation with market value-based appraisal orientation ( $r = 0.646$ ,  $p < 0.01$ ), accounting-oriented measurement capability ( $r = 0.652$ ,  $p < 0.01$ ), indicator-based assessment focus ( $r = 0.756$ ,  $p < 0.01$ ), value-added evaluation emphasis ( $r = 0.693$ ,  $p < 0.01$ ), and revenue-oriented criterion implementation ( $r = 0.708$ ,  $p < 0.01$ ). Moreover, a majority of correlations are less than 0.80 to be recommended by Hair et al. (2010), exceeding the relationship between organizational learning dynamism and indicator-based assessment focus. Table 14 shows that the maximum value of VIF (Equations 7-11) is 5.431, which is lower than the cut-off score of 10 (Hair et al., 2010). Thus, correlations and the VIF ensure the non-existence of multicollinearity problems.





Table 13: Descriptive Statistics and Correlation Matrix of Each Dimension of Integrated Performance Measurement System Strategy, Its Antecedences, and Accounting Competency

Variables	MBAO	AOMC	IBAF	VAEE	ROCI	TMS	OLD	MAS	ITC	CEI	AC	FA	FS
Mean	4.11	4.41	4.20	4.16	4.26	4.27	4.25	4.35	4.29	4.33	4.41	n/a	n/a
Standard Deviation	0.71	0.55	0.62	0.65	0.58	0.61	0.62	0.59	0.66	0.58	0.56	n/a	n/a
Market Value-Based Appraisal Orientation (MBAO)	1												
Accounting-Oriented Measurement Capability (AOMC)	.664***	1											
Indicator-Based Assessment Focus (IBAF)	.759***	.765***	1										
Value-Added Evaluation Emphasis (VAEE)	.733***	.716***	.832***	1									
Revenue-Oriented Criterion Implementation (ROCI)	.708***	.729***	.754***	.764***	1								
Top Management Support (TMS)	.739***	.755***	.774***	.756***	.710***	1							
Organizational Learning Dynamism (OLD)	.731***	.768***	.805***	.773***	.746***	.856***	1						
Best Management Accounting System (MAS)	.672***	.757***	.753***	.782***	.711***	.759***	.779***	1					
Information Technology Complementarity (ITC)	.652***	.732***	.740***	.750***	.688***	.752***	.810***	.877***	1				
Competitive Environment Intensity (CEI)	.646***	.652***	.756***	.693***	.708***	.713***	.748***	.731***	.741***	1			
Accounting Competency (AC)	.669***	.707***	.749***	.718***	.712***	.710***	.758***	.707***	.689***	.808***	1		
Firm Age (FA)	.034	.013	.020	-.008	.070	.098	.051	-.037	-.012	.125	.119	1	
Firm Size (FS)	.149	.103	.087	.171**	.138	.159**	.188**	.146	.168**	.095	.156	.126	1

\*\*\* Correlation is significant at the 0.01 level (2-tailed), \*\* Correlation is significant at the 0.05 level (2-tailed).

The results of OLS regression analysis are explained in Table 14. Firstly, the results indicate that top management support has a positive effect on four dimensions of integrated performance measurement system strategy which are: market value-based appraisal orientation ( $\beta_{37} = 0.349$ ,  $p < 0.01$ ), accounting-oriented measurement capability ( $\beta_{44} = 0.246$ ,  $p < 0.05$ ), indicator-based assessment focus ( $\beta_{51} = 0.195$ ,  $p < 0.05$ ), and value-added evaluation emphasis ( $\beta_{58} = 0.208$ ,  $p < 0.05$ ). It is generally known that top management is one who has the highest authority, and their decision-making highly influences the overall operations of the organization (Morakul and Wu, 2001). Dai, Montabon and Cantor (2015) claim that the top management support influences the creation of organizational values, and develops suitable management styles to direct organizational choices, as well as improve firm performance. Besides, Franco and Bourne (2003) confirm that top management support influences the increase of performance measurement system usage. Actually, lack of top management support is one reason of failure in managing the organization because executives will provide general support to achieve a good system and will encourage its usage for decision-making (Hillary, 2004). **Therefore, Hypotheses 10a, 10b, 10c and, 10d are supported.** The higher the top management support is, the more likely that a firm will gain greater (a) market value-based appraisal orientation, (b) accounting-oriented measurement capability, (c) indicator-based assessment focus, and (d) value-added evaluation emphasis.

Nevertheless, it has no significant relationship with revenue-oriented criterion implementation. Possibly, revenue within the organization fluctuates with the demand, and customer satisfaction more than. Top managers may support be the only part of the strategic capability of tracking performance. For example, they support the use of new techniques and methods, encourage the investment of resources, and support employees to participate in the operation and problem-solving of the organization; but they lack support activities to increase the motivation of customers, and promote and create long-term customer relationships (Peelen, 2005). As a result, top management support has no significant relationship with revenue-oriented criterion implementation. **Therefore, Hypothesis 10e is not supported.**

Secondly, the findings from this research describe that organizational learning dynamism has a positive effect on all dimensions of the integrated performance



measurement system strategy which is: market value-based appraisal orientation ( $\beta_{38} = 0.248$ ,  $p < 0.05$ ), accounting-oriented measurement capability ( $\beta_{45} = 0.276$ ,  $p < 0.05$ ), indicator-based assessment focus ( $\beta_{52} = 0.325$ ,  $p < 0.01$ ), value-added evaluation emphasis ( $\beta_{59} = 0.217$ ,  $p < 0.05$ ), and revenue-oriented criterion implementation ( $\beta_{66} = 0.301$ ,  $p < 0.01$ ). Accordingly, Marc et al. (2010) confirm that knowledge about management tools and strategies are the most important determinants of integrated performance measurement system usage within firms. Moreover, Franco and Bourne (2003) suggested that education and understanding new strategies of all members have a greater influence on how to manage an organization through tracking and measuring the overall performance of the firm. Organizational learning enhances the success of a performance measurement system (Rompho, 2009). Moreover, the organizational learning enhances sustainable competitive advantage and firm survival (Zahra, 2012) because learning is the process of acquiring, distributing, integrating, and creating information and knowledge among organizational members (Dixon, 1992; Huber, 1991; Wang and Ellinger, 2011), and still is the process that improves actions through better knowledge and understanding (Fiol and Lyles, 1985). **Thus, Hypotheses 11a, 11b, 11c, 11d and 11e are supported.** The higher the organizational learning dynamism is, the more likely that a firm will gain greater (a) market value-based appraisal orientation, (b) accounting-oriented measurement capability, (c) indicator-based assessment focus, (d) value-added evaluation emphasis and (e) revenue-oriented criterion implementation.

Thirdly, the findings from this research indicate that a best management accounting system positively affects four dimensions of integrated performance measurement system strategy that are: accounting-oriented measurement capability ( $\beta_{46} = 0.306$ ,  $p < 0.01$ ), indicator-based assessment focus ( $\beta_{53} = 0.173$ ,  $p < 0.10$ ), value-added evaluation emphasis ( $\beta_{60} = 0.338$ ,  $p < 0.01$ ), and revenue-oriented criterion implementation ( $\beta_{67} = 0.237$ ,  $p < 0.05$ ). Previous literature reviews indicated that the firm's management accounting systems are used for creating information within the organization to facilitate managers' decisions which must be consistent with the firm's strategic goals and control operational processes (Anthony and Govindarajan, 2001; Cheng, Luckett and Schulz, 2003; Chong and Eggleton 2003). The study of Lata and Ussahawanitchakit (2015) found that management accounting system effectiveness



increases performance evaluation effectiveness, cost information accuracy, and corporate practice efficiency. Moreover, it is also supported by the study of Waweru (2008) who found that the best management accounting systems are significantly associated with greater organizational strategy capacity. It can conclude that the best management accounting system can provide value-added information for control activity to achieve the firm and department's performance objectives (William and Seaman, 2002). **Thus, Hypotheses 12b, 12c, 12d and 12e are supported.** Briefly, the higher the best management accounting system is, the more likely that a firm will gain greater (b) accounting-oriented measurement capability, (c) indicator-based assessment focus, (d) value-added evaluation emphasis, and (e) revenue-oriented criterion implementation.

However, the best management accounting system has no effect on market value-based appraisal orientation. It is widely known that the management accounting system is generated to provide both internal and external accounting information to use for planning, budgeting, and predicting (Bouwens and Abernethy, 2000). Moreover, the firm's management accounting system creates accounting information to facilitate the managers' decisions in accordance with strategic goals, to control and track the overall operational processes, and to evaluate the activities of the organization and its members (Anthony and Govindarajan, 2001; Chong and Eggleton, 2003). On the other hand, market value-based appraisal orientation of IPMSS emphasizes measuring and tracking the market and customer performance; so the best management accounting system may not provide direct information related to marketing activities and clients. **Therefore, Hypothesis 12a is not supported.**

Fourthly, the analyses indicate that information technology complementarity does not significantly influence all dimensions of integrated performance measurement system strategy. The explanation for this is that sustaining a competitive advantage solely by technology is difficult because it can be effortlessly duplicated (Olugbode et al., 2007). Moreover, Zoysa and Herath (2007) suggested that information technology complementarity has no the impact on the firm's management system, and their empirical data indicates that many firms still use standard costing although technologies change all the time. It is consistent with Cui et al. (2012) who found that organizational resources (information technology) do not affect the firm's capabilities about integrated



performance measurement system strategy. **Thus, Hypotheses 13a, 13b, 13c, 13d, and 13e are not supported.**

Finally, competitive environment intensity significantly influences indicator-based assessment focus ( $\beta_{55} = 0.264$ ,  $p < 0.01$ ), and revenue-oriented criterion implementation ( $\beta_{69} = 0.251$ ,  $p < 0.01$ ). The results support the notion of differentiation, enabling firms to survive under fluctuating business environments. The fit between contextual factors and the design of management control systems is relevant to superior organizational performance (Chenhall, 2003; Ittner and Larcker, 1997; Luft and Shields, 2003). Bastian and Muchlish (2012) mentioned that perceived environment uncertainty and non-financial performance measurement system are significantly associated. Especially, external environmental factors have an impact on the effectiveness of IPMSS (France and Bourne, 2003) such as competitive market, public, regulated or private sector. The work of Henri (2006) found that environment uncertainty has a positive impact on the diversity of performance measurement usage. Moreover, the results of Gosselin (2005) found that a firm that operates in a more unstable environment is likely to use customer measures to supplement financial measures. **Thus, Hypotheses 14c and 14e are supported.** The higher the competitive environment intensity is, the more likely that a firm will gain greater (c) indicator-based assessment focus and (e) revenue-oriented criterion implementation.

However, the relationships among competitive environment intensity, market value-based appraisal orientation, accounting-oriented measurement capability, and value-added evaluation emphasis are not found. The result is supported by the study of Lee and Yang (2011) who found that the intensity of market competition is not significantly associated with the use of integrated performance measures, particularly, the use of financial measures, customer perspective measures and learning growth perspective measures. This suggests that the competition faced by the firm does not influence the use of integrated performance measures, and this result is consistent with the findings of Hoque and James (2000). **Therefore, Hypotheses 14a, 14b, and 14d are not supported.**

Additionally, the results of control variables indicate that firm age and firm size have no a significant effect on all five dimensions of integrated performance measurement system strategy. Results can be interpreted that an integrated performance



measurement system is not influenced by a firm's long period of time registered on the Stock Exchange of Thailand and higher total assets of the firm.

Table 14: Results of Regression Analysis for the Effects of Antecedents on Integrated Performance Measurement System Strategy

Independent Variables	Dependent Variables				
	MBAO	AOMC	IBAF	VAEE	ROCI
	Equation 7	Equation 8	Equation 9	Equation 10	Equation 11
Top Management Support (TMS: H10a-e)	<b>.349***</b> (.107)	<b>.246**</b> (.097)	<b>.195**</b> (.088)	<b>.208**</b> (.093)	.125 (.103)
Organizational Learning Dynamism (OLD: H11a-e)	<b>.248**</b> (.119)	<b>.276**</b> (.108)	<b>.325***</b> (.098)	<b>.217**</b> (.104)	<b>.301 ***</b> (.115)
Best Management Accounting System (MAS: H12a-e)	.157 (.118)	<b>.306***</b> (.107)	<b>.173*</b> (.097)	<b>.338***</b> (.102)	<b>.237 **</b> (.113)
Information Technology Complementarity (ITC: H13a-e)	-.059 (.122)	.053 (.111)	-.009 (.101)	.026 (.106)	-.044 (.118)
Competitive Environment Intensity (CEI: H14a-e)	.142 (.088)	.013 (.080)	<b>.264***</b> (.073)	.118 (.077)	<b>.251 ***</b> (.085)
<b>Control Variables:</b>					
Firm Age (FA)	-.058 (.111)	-.021 (.100)	-.074 (.091)	-.094 (.096)	.035 (.100)
Firm Size (FS)	.049 (.111)	-.084 (.101)	-.100 (.092)	.079 (.097)	.018 (.107)
<b>Adjusted R<sup>2</sup></b>	<b>0.581</b>	<b>0.656</b>	<b>0.717</b>	<b>0.683</b>	<b>0.613</b>
<b>Maximum VIF</b>	<b>5.431</b>	<b>5.431</b>	<b>5.431</b>	<b>5.431</b>	<b>5.431</b>

\*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.10

Beta coefficients with standard errors in parenthesis

### The Moderating Effects of Accounting Competency

Accounting competency is posited as the moderator in this research in order to test the moderating effects of accounting competency that influences the relationship between five antecedence variables, and each dimension of integrated performance measurement system strategy. These relationships are proposed as Hypotheses 15(a-e) - 19(a-e), and in Equations 12-16 and are shown in Figure 10.

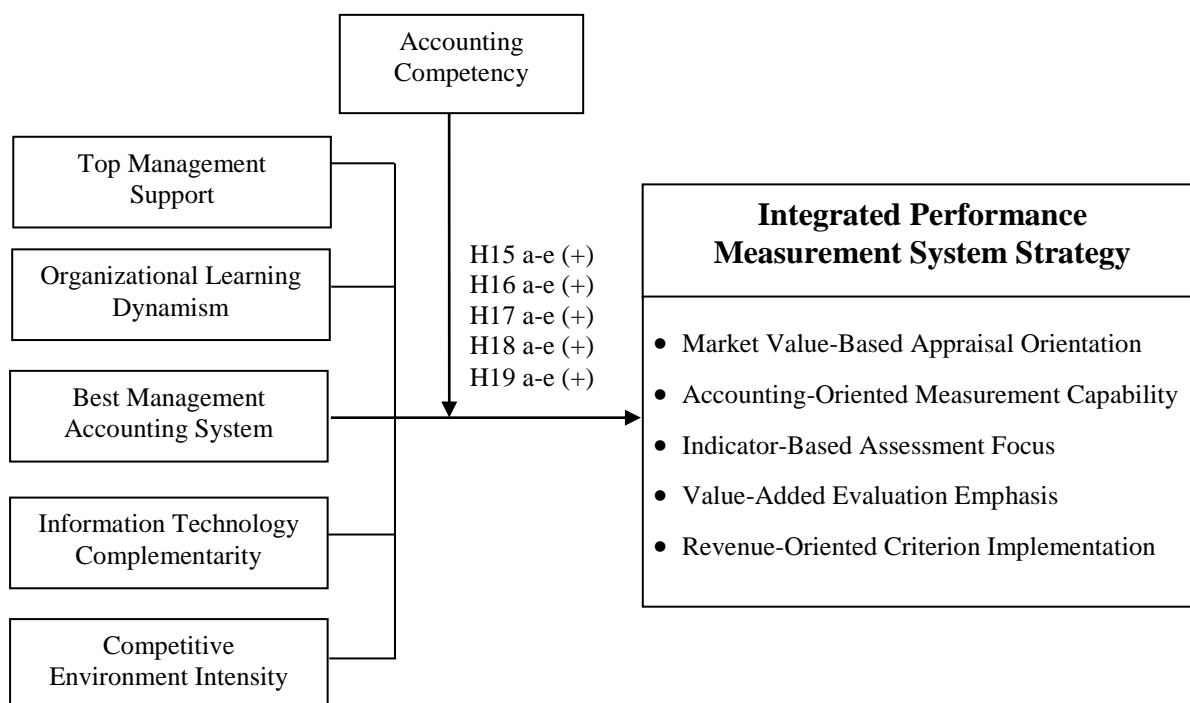
The correlation coefficients between accounting competency and five dimensions of integrated performance measurement system strategy (market value-based appraisal orientation, accounting-oriented measurement capability, indicator-based assessment focus, value-added evaluation emphasis, and revenue-oriented



criterion implementation) are 0.669, 0.707, 0.749, 0.718, and 0.712, respectively, and are shown in Table 13. All pairs of accounting competency and every dimension of IPMSS are significant and less than 0.80 as recommended by Hair et al. (2010).

In the correlation with five antecedence variables, accounting competency has a positive correlation with top management support ( $r = 0.710$ ,  $p < 0.01$ ), organizational learning dynamism ( $r = 0.758$ ,  $p < 0.01$ ), best management accounting system ( $r = 0.707$ ,  $p < 0.01$ ), information technology complementarity ( $r = 0.689$ ,  $p < 0.01$ ), and competitive environment intensity ( $r = 0.808$ ,  $p < 0.01$ ). Moreover, the majority of correlations are less than 0.80 as recommended by Hair et al. (2010), exceeding the relationship between accounting competency and competitive environment intensity only. Furthermore, the maximum value of VIF (Equations 12-16) is 8.919, as shown in Table 15, is lower than the cut-off value of 10. Thus, the multicollinearity problem is irrelevant.

Figure 10: Results of the Moderating Effects of Accounting Competency



From the findings in Table 15, the moderating effect of accounting competency on the relationships among five antecedents and each of five dimensions of integrated



performance measurement system strategy are as follows. It can be seen that accounting competency has a significant, moderating effects only in the relationship between competitive environment intensity and indicator-based assessment focus ( $\beta_{108} = 0.200$ ,  $p < 0.05$ ). This is consistent with the research of Chankaew, Ussahawanitchakit and Boonlua (2012) who found that accounting competency moderates the relationship between the firm's capabilities in management accounting technique and contextual factors. The firm's accounting competency that complies with a dynamic environment enhances efficiency management practice and operational performance (Prempree, Ussahawanitchakit and Boonlua, 2013). **Thus, Hypothesis 19c is supported.** Accounting competency positively moderates the relationship between competitive environment intensity and indicator-based assessment focus. On the other hand, accounting competency does not moderate the relationships between competitive environment intensity and market value-based appraisal orientation, accounting-oriented measurement capability, value-added evaluation emphasis, and revenue-oriented criterion implementation. **Thus, Hypotheses 19a, 19b, 19d, and 19e are not supported.**

Moreover, this research does not find the significant intervening effect of accounting competency on the relationships among top management support and five dimensions of integrated performance measurement system strategy (market value-based appraisal orientation, accounting-oriented measurement capability, indicator-based assessment focus, value-added evaluation emphasis, and revenue-oriented criterion implementation). These findings show that accounting competency does not make executives encourage or decide to more use integrated performance measurement system strategy into the organization. Harmoniously, the study of Iyer and Jha (2005) found that executives don't only rely on accounting information or believe of accounting executive's recommendation, but also they still consider information from other source and people both inside and outside the firm, budget, and the comparison between cost and benefit which arise from the use of such strategy as well. **Thus, Hypotheses 15a, 15b, 15c, 15d, and 15e are not supported.**

Next, the results also present the non-significance of the moderating effects of accounting competency on the relationship between organizational learning dynamism and five dimensions of integrated performance measurement system strategy. These





findings show that accounting competency does not enhance better knowledge and understanding of integrated performance measurement system strategy because the performance measurement of each firm often combines financial and non-financial measure together, thus training based on indicators that each employee is responsible can increase a better knowledge of staff. **Thus, Hypotheses 16a, 16b, 16c, 16d, and 16e are not supported.**

Similarly, accounting competency does not moderate the relationships between best management accounting system and all dimensions of integrated performance measurement system strategy. The result indicates accounting competency does not increase the information about accounting management for leading to the support of the integrated performance measurement system strategy. It is in accordance with the study of Sprinkle (2003) who found that data of accounting management is applied to track performance and expansively control the process administration of an organization. It hardly needs to rely on the financial information that Thai listed firms must report to third parties because it is just data that is generated by the standards and policies of the government only. **Thus, Hypotheses 17a, 17b, 17c, 17d, and 17e are not supported.**

Likewise, accounting competency does not moderate the relationships between information technology complementarity and all dimensions of integrated performance measurement system strategy. It is consistent with Zoysa and Herath (2007) and Cui et al. (2012) who found that information technology complementarity does not affect the firm's capabilities because many companies still use the standard costing although technologies change all the time. **Thus, Hypotheses 18a, 18b, 18c, 18d, and 18e are not supported.**

On the other hand, the result in Table 15 finds that accounting competency has a direct effect on four dimensions of integrated performance measurement system strategy (market value based appraisal orientation, accounting-oriented measurement capability, value-added evaluation emphasis, and revenue-oriented criterion implementation). It shows that accounting information and the skilled accountants are applied to direct support the implementation of the strategy. Besides, when firms have the rapid change of competitive environment, their accounting competency becomes to be an important role to indirectly affect indicator-based assessment focus (dimension 3) of integrated performance measurement system strategy.



Table 15: Results of Regression Analysis for the Moderating Effects of Accounting Competency

Independent Variables	Dependent Variables				
	MBAO	AOMC	IBAF	VAEE	ROCI
	Equation 12	Equation 13	Equation 14	Equation 15	Equation 16
<b>Top Management Support (TMS)</b>	<b>.325**</b> (.128)	<b>.226*</b> (.118)	<b>.177*</b> (.106)	<b>.232**</b> (.114)	.088 (.125)
Organizational Learning Dynamism (OLD)	.175 (.128)	.216* (.118)	<b>.276**</b> (.106)	.137 (.115)	<b>.244 *</b> (.125)
Best Management Accounting System (MAS)	.049 (.138)	<b>.361***</b> (.128)	.158 (.115)	<b>.296**</b> (.124)	<b>.262 *</b> (.135)
Information Technology Complementarity (ITC)	.075 (.152)	-.038 (.140)	-.022 (.126)	.024 (.136)	-.073 (.148)
Competitive Environment Intensity (CEI)	.011 (.113)	-.043 (.105)	<b>.261***</b> (.094)	.061 (.102)	<b>.204 *</b> (.111)
<b>Moderator :</b> Accounting Competency (AC)	<b>.265**</b> (.108)	<b>.188*</b> (.100)	.136 (.090)	<b>.184*</b> (.097)	<b>.189 *</b> (.106)
TMS*AC (H15a-e)	.094 (.105)	-.070 (.097)	-.037 (.087)	.032 (.094)	-.025 (.103)
OLD*AC (H16a-e)	-.052 (.118)	.001 (.109)	-.077 (.098)	-.004 (.106)	-.049 (.115)
MAS*AC (H17a-e)	-.048 (.135)	.119 (.125)	-.015 (.112)	-.060 (.121)	.112 (.132)
ITC*AC (H18a-e)	.199 (.146)	-.172 (.135)	.009 (.121)	-.037 (.131)	-.043 (.143)
CEI*AC (H19a-e)	.020 (.098)	.094 (.091)	<b>.200**</b> (.082)	.102 (.088)	.126 (.096)
<b>Control Variables:</b>					
Firm Age (FA)	-.084 (.109)	-.031 (.101)	-.103 (.091)	-.107 (.098)	.017 (.107)
Firm Size (FS)	.004 (.110)	-.100 (.101)	-.122 (.091)	.055 (.098)	-.015 (.107)
<b>Adjusted R<sup>2</sup></b>	<b>.608</b>	<b>.665</b>	<b>.729</b>	<b>.685</b>	<b>.625</b>
<b>Maximum VIF</b>	<b>8.919</b>	<b>8.919</b>	<b>8.919</b>	<b>8.919</b>	<b>8.919</b>

\*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.10

Beta coefficients with standard errors in parenthesis



## Summary

This chapter describes the results of data analysis in this research. There are two main parts. The first part indicates the respondent and sample characteristics. These characteristics are explained by a percentage. Besides, correlations among all variables are analyzed and presented as a correlation matrix and are explained by descriptive statistics such as mean and standard deviation. Another part points out the results and discussions of hypotheses testing in combination with specific correlation analysis and multiple regression analysis. The results reveal that market value-based appraisal orientation and value-added evaluation emphasis, treated as dimensions 1 and 4 respectively, are important determinants to yield higher sustainable organizational commitment, organizational citizenship behavior, continuous organizational loyalty, and organizational competitiveness. Interestingly, it can be stated that accounting-oriented measurement capability is the additional influence of sustainable organizational commitment to earn greater positive outcomes. In addition, not only indicator-based assessment focus has a strong positive impact organizational citizenship behavior and organizational competitiveness, but also revenue-oriented criterion implementation. Moreover, the antecedents of integrated performance measurement system strategy (organizational learning dynamism, top management support, and best management accounting system) seem to be the most influential determinants of integrated performance measurement system strategy. For the moderating role of accounting competency, it does not play a moderating role very well in order to impact the relationships among all antecedents and each dimension of integrated performance measurement system strategy. However, it moderates well on the relationship between competitive environment intensity and indicator-based assessment focus. To summarize, Hypotheses 1, 7, 8, 9 and 11 are significantly supported, Hypotheses 2, 3, 4, 5, 10, 12, 14 and 19 are partially supported, and Hypotheses 6, 13, 15, 16, 17, and 18 are not significantly supported. This research provides the summary of the results of hypotheses testing as presented in Table 16.

The next chapter illustrates the conclusion of the research which provides a summary of the entire research. Additionally, the contributions, limitations, and research directions for further research are also discussed.



Table 16: A Summary of the Results of Hypotheses Testing

Hypotheses	Description of Hypothesized Relationships	Results
H1a	The higher the market value-based appraisal orientation is, the more likely that a firm will gain greater sustainable organizational commitment.	Supported
H1b	The higher the market value-based appraisal orientation is, the more likely that a firm will gain greater organizational citizenship behavior.	Supported
H1c	The higher the market value-based appraisal orientation is, the more likely that a firm will gain greater continuous organizational loyalty.	Supported
H1d	The higher the market value-based appraisal orientation is, the more likely that a firm will gain greater organizational competitiveness.	Supported
H2a	The higher the market value-based appraisal orientation is, the more likely that a firm will gain greater organizational citizenship behavior.	Supported
H2b	The higher the accounting-oriented measurement capability is, the more likely that a firm will gain greater organizational citizenship behavior.	Not Supported
H2c	The higher the accounting-oriented measurement capability is, the more likely that a firm will gain greater continuous organizational loyalty.	Not Supported
H2d	The higher the accounting-oriented measurement capability is, the more likely that a firm will gain greater organizational competitiveness.	Not Supported
H3a	The higher the indicator-based assessment focus is, the more likely that a firm will gain greater sustainable organizational commitment.	Not Supported



Table 16: A Summary of the Results of Hypotheses Testing (continued)

Hypotheses	Description of Hypothesized Relationships	Results
H3b	The higher the indicator-based assessment focus is, the more likely that a firm will gain greater organizational citizenship behavior.	Supported
H3c	The higher the indicator-based assessment focus is, the more likely that a firm will gain greater continuous organizational loyalty.	Not Supported
H3d	The higher the indicator-based assessment focus is, the more likely that a firm will gain greater organizational competitiveness.	Supported
H4a	The higher the value-added evaluation emphasis is, the more likely that a firm will gain greater sustainable organizational commitment.	Supported
H4b	The higher the value-added evaluation emphasis is, the more likely that a firm will gain greater organizational citizenship behavior.	Supported
H4c	The higher the value-added evaluation emphasis is, the more likely that a firm will gain greater continuous organizational loyalty.	Supported
H4d	The higher the value-added evaluation emphasis is, the more likely that a firm will gain greater organizational competitiveness.	Not Supported
H5a	The higher the revenue-oriented criterion implementation is, the more likely that a firm will gain greater sustainable organizational commitment.	Not Supported
H5b	The higher the revenue-oriented criterion implementation is, the more likely that a firm will gain greater organizational citizenship behavior.	Supported



Table 16: A Summary of the Results of Hypotheses Testing (continued)

Hypotheses	Description of Hypothesized Relationships	Results
H5c	The higher the revenue-oriented criterion implementation is, the more likely that a firm will gain greater continuous organizational loyalty.	Not Supported
H5d	The higher the revenue-oriented criterion implementation is, the more likely that a firm will gain greater organizational competitiveness.	Supported
H6	The higher the sustainable organizational commitment is, the more likely that a firm will gain greater organizational competitiveness.	Not Supported
H7	The higher the organizational citizenship behavior is, the more likely that a firm will gain greater organizational competitiveness.	Supported
H8	The higher the continuous organizational loyalty is, the more likely that a firm will gain greater organizational competitiveness.	Supported
H9	The higher the organizational competitiveness is, the more likely that a firm will gain greater firm success.	Supported
H10a	The higher the top management support is, the more likely that a firm will gain greater market value-based appraisal orientation.	Supported
H10b	The higher the top management support is, the more likely that a firm will gain greater accounting-oriented measurement capability.	Supported
H10c	The higher the top management support is, the more likely that a firm will gain greater indicator-based assessment focus.	Supported
H10d	The higher the top management support is, the more likely that a firm will gain greater value-added evaluation emphasis.	Supported



Table 16: A Summary of the Results of Hypotheses Testing (continued)

Hypotheses	Description of Hypothesized Relationships	Results
H10e	The higher the top management support is, the more likely that a firm will gain greater revenue-oriented criterion implementation.	Not Supported
H11a	The higher the organizational learning dynamism is, the more likely that a firm will gain greater market value-based appraisal orientation.	Supported
H11b	The higher the organizational learning dynamism is, the more likely that a firm will gain greater accounting-oriented measurement capability.	Supported
H11c	The higher the organizational learning dynamism is, the more likely that a firm will gain greater indicator-based assessment focus.	Supported
H11d	The higher the organizational learning dynamism is, the more likely that a firm will gain greater value-added evaluation emphasis.	Supported
H11e	The higher the organizational learning dynamism is, the more likely that a firm will gain greater revenue-oriented criterion implementation.	Supported
H12a	The higher the best management accounting system is, the more likely that a firm will gain greater market value-based appraisal orientation.	Not Supported
H12b	The higher the best management accounting system is, the more likely that a firm will gain greater accounting-oriented measurement capability.	Supported
H12c	The higher the best management accounting system is, the more likely that a firm will gain greater indicator-based assessment focus.	Supported



Table 16: A Summary of the Results of Hypotheses Testing (continued)

Hypotheses	Description of Hypothesized Relationships	Results
H12d	The higher the best management accounting system is, the more likely that a firm will gain greater value-added evaluation emphasis.	Supported
H12e	The higher the best management accounting system is, the more likely that a firm will gain greater revenue-oriented criterion implementation.	Supported
H13a	The higher the information technology complementarity is, the more likely that a firm will gain greater market value-based appraisal orientation.	Not Supported
H13b	The higher the information technology complementarity is, the more likely that a firm will gain greater accounting-oriented measurement capability.	Not Supported
H13c	The higher the information technology complementarity is, the more likely that a firm will gain greater indicator-based assessment focus.	Not Supported
H13d	The higher the information technology complementarity is, the more likely that a firm will gain greater value-added evaluation emphasis.	Not Supported
H13e	The higher the information technology complementarity is, the more likely that a firm will gain greater revenue-oriented criterion implementation.	Not Supported
H14a	The higher the competitive environment intensity is, the more likely that a firm will gain greater market value-based appraisal orientation.	Not Supported
H14b	The higher the competitive environment intensity is, the more likely that a firm will gain greater accounting-oriented measurement capability.	Not Supported





Table 16: A Summary of the Results of Hypotheses Testing (continued)

Hypotheses	Description of Hypothesized Relationships	Results
H14c	The higher the competitive environment intensity is, the more likely that a firm will gain greater indicator-based assessment focus.	Not Supported
H14d	The higher the competitive environment intensity is, the more likely that a firm will gain greater value-added evaluation emphasis.	Supported
H14e	The higher the competitive environment intensity is, the more likely that firm will gain greater revenue-oriented criterion implementation.	Supported
H15a	Accounting competency positively moderates the relationship between top management support and market value-based appraisal orientation.	Not Supported
H15b	Accounting competency positively moderates the relationship between top management support and accounting-oriented measurement capability.	Not Supported
H15c	Accounting competency positively moderates the relationship between top management support and indicator-based assessment focus.	Not Supported
H15d	Accounting competency positively moderates the relationship between top management support and value-added evaluation emphasis.	Not Supported
H15e	Accounting competency positively moderates the relationship between top management support and revenue-oriented criterion implementation.	Not Supported
H16a	Accounting competency positively moderates the relationship between organizational learning dynamism and market value-based appraisal orientation.	Not Supported



Table 16: A Summary of the Results of Hypotheses Testing (continued)

Hypotheses	Description of Hypothesized Relationships	Results
H16b	Accounting competency positively moderates the relationship between organizational learning dynamism and accounting-oriented measurement capability.	Not Supported
H16c	Accounting competency positively moderates the relationship between organizational learning dynamism and indicator-based assessment focus.	Not Supported
H16d	Accounting competency positively moderates the relationship between organizational learning dynamism and value-added evaluation emphasis.	Not Supported
H16e	Accounting competency positively moderates the relationship between organizational learning dynamism and revenue-oriented criterion implementation.	Not Supported
H17a	Accounting competency positively moderates the relationship between best management accounting system and market value-based appraisal orientation.	Not Supported
H17b	Accounting competency positively moderates the relationship between best management accounting system and accounting-oriented measurement capability.	Not Supported
H17c	Accounting competency positively moderates the relationship between best management accounting system and indicator-based assessment focus.	Not Supported
H17d	Accounting competency positively moderates the relationship between best management accounting system and value-added evaluation emphasis.	Not Supported
H17e	Accounting competency positively moderates the relationship between best management accounting system and revenue-oriented criterion implementation.	Not Supported



Table 16: A Summary of the Results of Hypotheses Testing (continued)

Hypotheses	Description of Hypothesized Relationships	Results
H18a	Accounting competency positively moderates the relationship between information technology complementarity and market value-based appraisal orientation.	Not Supported
H18b	Accounting competency positively moderates the relationship between information technology complementarity and accounting-oriented measurement capability.	Not Supported
H18c	Accounting competency positively moderates the relationship between information technology complementarity and indicator-based assessment focus.	Not Supported
H18d	Accounting competency positively moderates the relationship between information technology complementarity and value-added evaluation emphasis.	Not Supported
H18e	Accounting competency positively moderates the relationship between information technology complementarity and revenue-oriented criterion implementation.	Not Supported
H19a	Accounting competency positively moderates the relationship between competitive environment intensity and market value-based appraisal orientation.	Not Supported
H19b	Accounting competency positively moderates the relationship between competitive environment intensity and accounting-oriented measurement capability.	Not Supported
H19c	Accounting competency positively moderates the relationship between competitive environment intensity and indicator-based assessment focus.	Supported
H19d	Accounting competency positively moderates the relationship between competitive environment intensity and value-added evaluation emphasis.	Not Supported



Table 16: A Summary of the Results of Hypotheses Testing (continued)

Hypotheses	Description of Hypothesized Relationships	Results
H19e	Accounting competency positively moderates the relationship between competitive environment intensity and revenue-oriented criterion implementation.	Not Supported



## CHAPTER V

### CONCLUSION

The previous chapter reveals respondent characteristics, descriptive statistics, a correlation matrix, and the results of hypotheses testing. Therefore, this chapter aims to describe the conclusion, the theoretical and managerial contributions, limitations, and suggestions for further research.

This research investigates the effect of integrated performance measurement system strategy on sustainable organizational commitment, organizational citizenship behavior, continuous organizational loyalty, organizational competitiveness, and firm success in Thai-listed firms. Besides, top management support, organizational learning dynamism, best management accounting system, competitive environment intensity and information technology complementarity are assigned as the antecedents of integrated performance measurement system strategy. The moderating effects of accounting competency are also tested. Meanwhile, accounting competency is defined as moderating the relationships between each of five dimensions of the integrated performance measurement system strategy and its antecedents.

It can be stated that the key research question is, “How does integrated performance measurement system strategy affect firm success?” In detail, there are five specific research questions as follows: 1) How does each dimension of integrated performance measurement system strategy influence sustainable organizational commitment, organizational citizenship behavior, continuous organizational loyalty, and organizational competitiveness? 2) How do sustainable organizational commitment, organizational citizenship behavior, and continuous organizational loyalty influence organizational competitiveness? 3) How does organizational competitiveness affect firm success? 4) How do top management support, organizational learning dynamism, best management accounting system, information technology complementarity, and competitive environment intensity influence each dimension of integrated performance measurement system strategy? 5) How does accounting competency moderate the relationships between top management support, organizational learning dynamism, best management accounting system, information technology complementarity, competitive



environment intensity, and each dimension of integrated performance measurement system strategy?

This research applies two theories to draw the conceptual model, including the RBV and contingency theories. For research investigation, Thai-listed firms are selected as the research population due to the concern of integrated performance measurement system strategy (Rompho, 2009). The sample of this investigation is selected from the database of the Stock Exchange of Thailand on its website, <http://www.set.or.th/> as of April 11, 2016. For data collection, a mailed questionnaire was employed to gather data, and 696 questionnaires were sent to the accounting executive (e.g. accounting director, accounting manager,) who is the key informant. For statistical analysis, multiple regression analysis is used to analyze the data. It can be concluded that the majority of the hypotheses tested is partially supported. The results of each hypothesis according to each specific research question are described below:

According to the first specific research question, the results indicate that market value-based appraisal orientation (the first dimension) positively affects sustainable organizational commitment, organizational citizenship behavior, continuous organizational loyalty, and organizational competitiveness. In addition, accounting-oriented measurement capability (the second dimension) has a positive effect on sustainable organizational commitment. Moreover, indicator-based assessment focus (the third dimension) has a significant impact on two consequences, including organizational citizenship behavior and organizational competitiveness. Furthermore, value-added evaluation emphasis (the fourth dimension) significantly and positively influences three outcomes: sustainable organizational commitment, organizational citizenship behavior, and continuous organizational loyalty. Interestingly, revenue-oriented criterion implementation positively affects organizational citizenship behavior and organizational competitiveness.

For the second specific research question, the result shows that organizational citizenship behavior and continuous organizational loyalty positively influence organizational competitiveness. In the third specific research question, the finding presents that organizational competitiveness has a strong positive effect on firm success.

With reference to the fourth specific research question, it is found that top management support has a positive impact on the four dimensions of integrated



performance measurement system strategy, namely, market value-based appraisal orientation, accounting-oriented measurement capability, indicator-based assessment focus, and value-added evaluation emphasis. Interestingly, organizational learning dynamism influences all dimensions of integrated performance measurement system strategy. Moreover, best management accounting system positively affects accounting-oriented measurement capability, indicator-based assessment focus, value-added evaluation emphasis, and revenue-oriented criterion implementation. As can be seen from the findings, competitive environment intensity has a positive effect on indicator-based assessment focus and revenue-oriented criterion implementation. However, the result also shows that information technology complementarity does not significantly influence all dimensions of integrated performance measurement system strategy. In according to the fifth specific research question, that accounting competency plays a significant moderating role only in the relationships between competitive environment intensity and indicator-based assessment focus.

### **Summary of Results**

In conclusion, the integrated performance measurement system strategy is essential for positive outcomes. In particular, market value-based appraisal orientation seems to be essential components of the integrated performance measurement system strategy leading to increase sustainable organizational commitment, organizational citizenship behavior, continuous organizational loyalty, and organizational competitiveness. In addition, indicator-based assessment focus, market value-based appraisal orientation, and revenue-oriented criterion implementation affect organizational competitiveness. Moreover, organizational citizenship behavior and continuous organizational loyalty positively affect organizational competitiveness. The antecedent variables of integrated performance measurement system strategy are organizational learning dynamism, top management support, and best management accounting system which seems to be the most influential determinants of integrated performance measurement system strategy. The results are summarized and shown in Table 17 and Figure 11 below.



Table 17: A Summary of Results in All Research Questions

Research Questions	Hypotheses	Results	Conclusions
<p><u>Specific Research Question</u></p> <p>(1) How does each dimension of integrated performance measurement system strategy influence sustainable organizational commitment, organizational citizenship behavior, continuous organizational loyalty, and organizational competitiveness?</p>	<p>H1a-d</p> <p>H2a-d</p> <p>H3a-d</p> <p>H4a-d</p> <p>H5a-d</p>	<p>- Market value-based appraisal orientation positively influences sustainable organizational commitment, organizational citizenship behavior, continuous organizational loyalty, and organizational competitiveness.</p> <p>- Accounting-oriented measurement capability has a positive effect on sustainable organizational commitment.</p> <p>- Indicator-based assessment focus has a positive impact on organizational citizenship behavior and organizational competitiveness.</p> <p>- Value-added evaluation emphasis has a strong positive effect on sustainable organizational commitment and continuous organizational loyalty and organizational citizenship behavior.</p> <p>- Revenue-oriented criterion implementation positively affects organizational citizenship behavior and organizational competitiveness.</p>	<p>Partially supported</p>





Table 17: A Summary of Results in All Research Questions (continued)

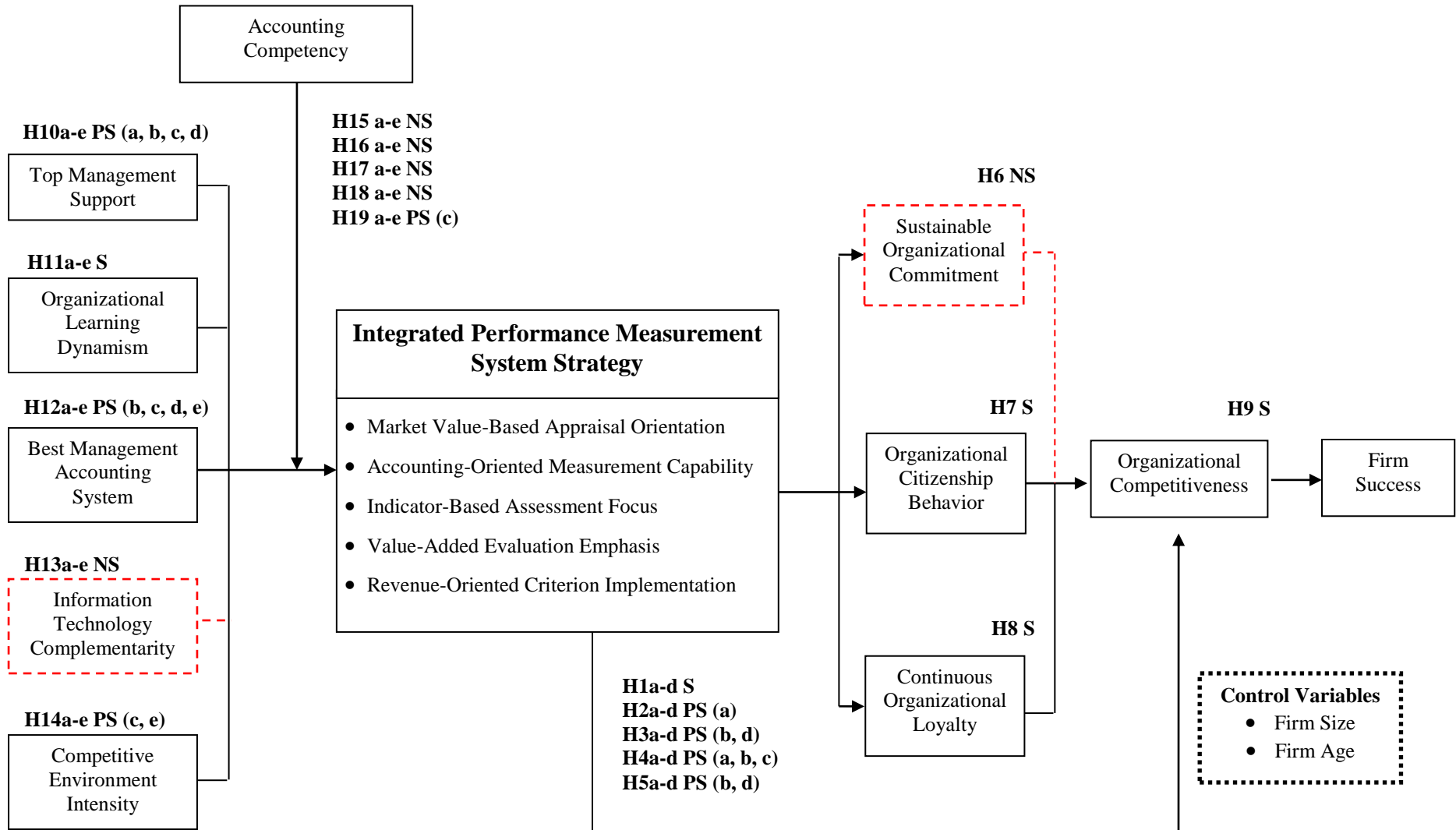
Research Questions	Hypotheses	Results	Conclusions
(2) How do sustainable organizational commitment, organizational citizenship behavior, and continuous organizational loyalty influence organizational competitiveness?	H6	- Sustainable organizational commitment does not significantly influence organizational competitiveness.	Partially Supported
	H7	- Organizational citizenship behavior has a positive impact on organizational competitiveness.	
	H8	- Continuous organizational loyalty has a strong, positive effect on organizational competitiveness.	
(3) How does organizational competitiveness affect firm success?	H9	- Organizational competitiveness positively affects firm success	Fully supported
(4) How do top management support, organizational learning dynamism, best management accounting system, information technology complementarity, and competitive environment intensity influence each dimension of integrated performance measurement system strategy?	H10 a-e	- Top management support has a positive effect on market value-based appraisal orientation, accounting-oriented measurement capability, indicator-based assessment focus, and value-added evaluation emphasis.	Partially Supported
	H11 a-e	- Organizational learning dynamism has a positive effect on all dimensions of integrated performance measurement system strategy.	
	H12 a-e	- Best management accounting system positively affects accounting-oriented measurement capability, indicator-based assessment focus, value-added evaluation emphasis, and revenue-oriented criterion implementation.	

Table 17: A Summary of Results in All Research Questions (continued)

Research Questions	Hypotheses	Results	Conclusion
(4) How do top management support, organizational learning dynamism, best management accounting system, information technology complementarity, and competitive environment intensity influence each dimension of integrated performance measurement system strategy?	H13 a-e  H14 a-e	- Information technology complementarity does not influence all dimensions of integrated performance measurement system strategy.  - Competitive environment intensity positively affects indicator-based assessment focus and revenue-oriented criterion implementation.	Partially Supported
(5) How does accounting competency moderate the relationships between top management support, organizational learning dynamism, best management accounting system, information technology complementarity, competitive environment intensity, and each dimension of integrated performance measurement system strategy?	H15a-e H16a-e H17a-e H18a-e H19a-e	- Accounting competency has a significant, moderating effect only in the relationship between competitive environment intensity and indicator-based assessment focus.	Partially Supported



Figure 11: Model Summary of the Results of the Hypotheses Testing



Note:

(S) = Hypotheses Supported (5 Hypotheses)

(PS) = Hypotheses Partial Supported and supported hypotheses are shown in parentheses (8 Hypotheses)

(NS) = Hypotheses Not Supported (6 Hypotheses)



## **Theoretical and Managerial Contributions**

### Theoretical Contribution

This research indicates the causal relationships among the dimensions of integrated performance measurement system strategy (IPMSS) and firm success of Thai-listed firms. The five dimensions of integrated performance measurement system strategy, including 1) market value-based appraisal orientation, 2) accounting-oriented measurement capability, 3) indicator-based assessment focus, 4) value-added evaluation emphasis, and 5) revenue-oriented criterion implementation, are newly developed and firstly examined in order to clarify into its concept which will be useful for further research. Particularly, all dimensions cover the firm's main capabilities to measure and track the overall organizational performance through the selection use the diverse methods and metrics for monitoring the progress related to strategic objectives and action plans, allocating responsibilities, supporting the right decision-making, setting performance targets and rewarding outcomes. Furthermore, the empirical evidence of this research confirms that the five dimensions of integrated performance measurement system strategy are the important organizational capabilities that enhance organizational competitiveness and firm success based on the resource-based view (RBV) which this theory indicates that the firm's competitive advantage relies on the firm's resources and capabilities. Moreover, IPMSS has an influence on the efficiency and effectiveness of firm success through the employees' attitude and behavior which consist of sustainable organizational commitment, organizational citizenship behavior, and continuous organizational loyalty. Thus, the first theoretical contribution is the presentation of new dimensions of integrated performance measurement system strategy that are newly created and empirically tested by the construct of their antecedents and consequents. Besides, there are a few prior empirical studies that investigate the new dimensions of integrated performance measurement system strategy and still a lack of focusing on the strategic capability of an integrated approach to the management accounting discipline. In spite of this current, these dimensions are very important to create and improve organizational competitiveness and firm success.

This research not only presents about the constructs of integrated performance measurement system strategy but also there is the empirical result of the influence of



integrated performance measurement system strategy on sustainable organizational commitment, organizational citizenship behavior, continuous organizational loyalty, organizational competitiveness, and firm success. The results help expand the ability to explain the business phenomena of organizational competitiveness and firm success of Thai-listed firms based on the resource-based view (RBV), that the firm's integrated performance measurement system strategy is the capability that increases organizational competitiveness and firm success through organizational citizenship behavior and continuous is organizational loyalty. Particularly, the results also confirm that market value-based appraisal orientation and value-added evaluation emphasis, treated as dimensions 1 and 4 of integrated performance measurement system strategy are important determinants to reinforce organizational citizenship behavior and continuous organizational loyalty, which both positively influence organizational competitiveness and firm success. Furthermore, the another empirical result is in accordance with the fundamental principle of contingency theory in explaining the positive relationships among the internal and external factors (top management support, organizational learning dynamism, best management accounting system, and competitive environment intensity) and each dimension of integrated performance measurement system strategy. Thus, the second theoretical contribution is this research provides the of comprehensive empirical evidence to gain more understanding and knowledge of the relationships between integrated performance measurement system strategy and firm success in the perspective of accounting academics that there is a difference from the past research. Especially, the five dimensions focus on the firm's capabilities to measure and track the overall organizational performance such as the performance perspectives of customer, market, finance, accounting, cost, operation, community, supplier, employee, training development, sales, and revenue. Besides, the integrated performance measurement systems strategy in this research has incorporated the main framework of performance measurement, both from the four perspectives of Balanced Scorecard; and the perspectives of social, employee, market, and supplier in Performance Prism in order to solve the defects and weaknesses of the traditional performance measurement as well. Moreover, in the business context of Thai-listed firms, this strategy is different from the countries of the West because the firm's experience and firm size, which is measured by the total asset of the firm to do not affect the implementation of this strategy.



### Managerial Contribution

From the interesting results mentioned earlier, there are four managerial implications for firms and their accounting executives. Firstly, the results can provide guidelines for firms that the integration and development of performance measurement system strategy should match the style of each firm's business operation. Especially, market value-based appraisal orientation and value-added evaluation emphasis in the integrated performance measurement system strategy are the critical perspectives that all firms should provide importance and more emphasize because they are likely to increase greater sustainable organizational commitment, organizational citizenship behavior, continuous organizational loyalty, and organizational competitiveness.

Secondly, the results can provide guidelines for the improvement and maintenance of organizational competitiveness and firm success as a result of the implementation of integrated performance measurement system strategy, organizational citizenship behavior, and continuous organizational loyalty. Thus, firms and executives should be aware of the creation of good behavior of the organization's member because the high organizational citizenship behavior can enhance competitiveness. Moreover, firms and executives should encourage their employees to have continuous loyalty because it can contribute to greater efficiency, better business outcomes, firm success, and the reduction of employee turnover.

Thirdly, firms require determining, aligning, and encouraging the integrated performance measurement system strategy because it can actively and consistently provide the comprehensive performance to improve organizational citizenship behavior and loyalty of employees to increase competitive advantage resulting in the firm's higher success. In addition, firms need not only to possess critical resources, but they are also supposed to apply these resources, and are awakened to take the integrated performance measurement system strategy to improve their business practice, the positive behavior of employees, and organizational competitiveness.

Fourthly, the results also indicate key internal and external factors that have an effect on the implementation of the integrated performance measurement system strategy for managers or directors of Thai-listed firms. Thus, organizational learning dynamism is the most influential determinants of the firm's integrated performance measurement system strategy usage. Training based on indicators or measures the



responsibility of each employee can increase the success of integrated performance measurement system strategy usage. Moreover, top management support and best management accounting system are the key factors which influence the success of integrated performance measurement system usage within firms as well.

## **Limitations and Future Research Directions**

### Limitations

There are three limitations: the first limitation is the small sample size. The sample size of this research has only 153 respondents, which is considered a small sample for the measure of eighteen variables (include dummy variables). As a result, this may affect the analytical power of the statistical tests so that the results are possibly weakened. Secondly, this research collects data from firms which have registered in SET in April 2016 in Thailand. Besides, Thai-listed firms have differences of rules, regulations, and their performance measurement system strategies for other companies, but also they must continually report the information to the public. Thus, the findings can not generalize to other sectors or countries. The third limitation is the relatively short period time of the data collection procedure which started from the delivery process to the follow-up of letters to only take approximately 2 months. During the time period of surveys (June-August), the accounting executives of Thai-listed firms were preparing their financial report for the second quarter (April-June) and for the first half year (January-June), and they had to report and send it within 45 days after the end of the second quarter (July-August) and 2 months after the end of the 2nd quarter (July-September), respectively. As a result, it is possible to claim that the key informant may not be able for the survey participation because they are in busy season.

### Future Research Directions

According to methodological limitations, some suggestions for further research are provided as follows: Firstly, other sectors and industries need to be explored to uncover the full range of the ability of integrated performance measurement system strategy of firms, as well as to assure the findings of this research. Secondly, accounting competency should be determined as the antecedent variable of integrated performance



measurement system strategy. Thirdly, longitudinal research could be examined for further research to follow-up the accurate nature of the integrated performance measurement system in each firm in the long-term. Fourthly, mixed research methods should be further conducted to explore to update points of views, which are essential for appropriately developing a new scale. Fifthly, since the moderating effect of accounting competency is found only in the relationship between competitive environment intensity and indicator-based assessment focus, further research should investigate other moderating variables associating with the maintenance and improvement of long-term strategic capabilities such as collaborative communication, and goal communication. Sixthly, since firm size (is measured by the period of time registered on the Stock Exchange in Thailand) and firm age (is measured by the total assets of the firm) do not affect the integrated performance measurement system strategy usage in the context of Thai-listed firms, further research should investigate other control variables or to measure these two variables by other firm characteristics instead.





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## **APPENDICES**





**APPENDIX A**  
**The Original Items**



Table 1A: Original Items in Scales

Construct	Items
<b>Market Value-Based Appraisal Orientation (MBAO)</b>	
MBAO 1	Firm believes that the assessment of the performance based on market value to increase the administrative efficiency.
MBAO 2	Firm gives special importance to the application of a variety of marketing criteria to measure performance to help make the operation of the firm that can achieve its goals well.
MBAO 3	Firm emphasizes the analysis of the pros and cons of each type of market criteria to utilize to measure performance that lead to achieving the firm's operational objectives well.
MBAO 4	Firm strives to integrate various issues of related marketing to apply to measure performance that lead to the higher organizational competitiveness.
<b>Accounting-Oriented Measurement Capability (AOMC)</b>	
AOMC 1	Firm believes that the adoption of the accounting data to use as the guide to performance measurement to help operational outcomes to reflect the clearer real picture of overall performance.
AOMC 2	Firm gives importance to integrate accounting, cost, and financial data together systematically and fairly lead to the more comprehensive performance measurement.
AOMC 3	Firm emphasizes providing to have the analysis of the advantages and disadvantages of the use of accounting information in performance measurement continuously to increase the business management efficiently.
AOMC 4	Firm realizes that the accounting information which is applied to measure well when it can reflect the situation of whole business operations.
<b>Indicator-Based Assessment Focus (IBAF)</b>	
IBAF 1	Firm believes that the variety of indicators to measure the success of the implementation to help a firm has better efficiency and more effectiveness both in present and future.
IBAF 2	Firm focuses on research to find performance measurement indicators which have quality continued to increase more organizational competitiveness.
IBAF 3	Firm always recognizes that a variety of indicators which are used for measuring the success of organizational implementation to be beneficial to the good business development in a long-term.
IBAF 4	Firm encourages the development and creation of both financial and non-financial indicators and qualitative and quantitative indicators to measure performance to expand overall performance measurement is more comprehensive.



Table 1A: Original Items in Scales (continued)

Construct	Items
<b>Value-Added Evaluation Emphasis (VAEE)</b>	
VAEE 1	Firm believes that the evaluation of performance which focus on Value-Added to aid business operations can achieve its goal well.
VAEE 2	Firm emphasizes to create the activities that contribute to organizational development, both in the present and the future to enable achieving its goal more efficiently.
VAEE 3	Firm encourages leading the outcomes of staffs' training and development to use as the guideline for performance measurement within the organization to increase better operational successes.
VAEE 4	Firm is engrossed in bringing innovations which occur in the organization to use as criteria for performance measurement to boost organizational competitiveness even more.
<b>Revenue-Oriented Criterion Implementation (ROCI)</b>	
ROCI 1	Firm believes that revenue and sales data when are brought to use as criteria for performance measurement to help enhance the potential of its administration even more.
ROCI 2	Firm focuses on the systematic and the concrete presentation of income and sales information on all activities for supporting the more success of business operations.
ROCI 3	Firm emphasizes the development of potential systems to recognize and investigate all revenues justly as a result of the highest effective operation.
ROCI 4	Firm encourages each department increasing the potential generation of revenue continually to allow the operation toward success fast.
<b>Sustainable Organizational Commitment (SOC)</b>	
SOC 1	Employees are willing and ready to do everything to requite to the organization clearly.
SOC 2	Employees are proud to be a part of the organization and are willing for sacrifice and dedication in working for the organization as best they can do it.
SOC 3	Employees love and commit to working with the organization in the future.
SOC 4	Employees have confidence in the potential and ability of organizational management.
SOC 5	Employees recognize that the problems in the organization to be like as their problem, and they are ready to assist and cooperate willingly.
<b>Organizational Citizenship Behavior (OCB)</b>	
OCB 1	Employees are usually willing to help a firm whenever they see that their organization or co-workers to request assistance and they are regardless of the benefits of themselves.
OCB 2	Employees have a positive attitude and willingness to endure to problems, difficulties, stress and pressures which arise from co-workers or works.



Table 1A: Original Items in Scales (continued)

Construct	Items
<b>Organizational Citizenship Behavior (OCB)</b>	
OCB 3	Employees have integrity in their work, on time, maintain the organization's asset is like as of themselves and can manage work time appropriately by do not spend their work times in other matters.
OCB 4	Employees seek new ways of working in order to improve their performance, and they can provide recommendations and offer new ways for the firm to enhance competitiveness in the long term.
OCB 5	Employees adhere to compliance the rules, and regulations that are consistent with the needs of society and the public continuously.
<b>Continuous Organizational Loyalty (COL)</b>	
COL 1	Employees express to support their organization and always positively communicate the firm's information with outsiders.
COL 2	Employees always have awareness concerning the creation of love and devotion to the organization, executives, and their works.
COL 3	Employees are loyal to the organization due to creating a better relationship between the organization and employees continually.
COL 4	Employees have integrity in the performance and do not express behaviors that cause corruption or fraud of the assets and interests of the organization, as well as not to cause damage to an organization in the present and the future.
COL 5	Employees adhere and desire to work to achieve the goals of the firm continually.
<b>Organizational Competitiveness (OCT)</b>	
OCT 1	Firm has the management of its available resources to achieve maximum efficiency.
OCT 2	Firm offers new methods and innovations that have the potential to be used in the whole corporate management contribute to the increase of more efficiency and outstanding than other competitors.
OCT 3	Firm's market share, sales growth, and profit margin are higher than its competitors in the same industry.
OCT 4	Firm can create distinctively about the quality of products and service, and is accepted by clients continuously.
OCT 5	Firm's overall operating performance are stronger, better and higher than its competitors, as well as it is still recognized that the production and distribution of goods and the services are more than its competitors.
<b>Firm Success (FSC)</b>	
FSC 1	Firm can achieve in terms of quality, efficiency and effectiveness of operations very well.
FSC 2	Firm can sustain the growth and survive of business in the future continuously despite obstacles or any crisis.



Table 1A: Original Items in Scales (continued)

Construct	Items
<b>Firm Success (FSC)</b>	
FSC 3	Firm has been accepted and is known for its customers and firms in the same industry about the ability to operate effectively and to achieve the set of goals.
FSC 4	Firm can increase the potential and the ability of personnel to be concrete and continuous.
FSC 5	The firm's overall performance both in monetary and non-monetary are in accord with the plan, vision, mission, and goals of the business.
<b>Top Management Support (TMS)</b>	
TMS 1	Top management believes that the use of new techniques and methods will make the administration more successfully.
TMS 2	Top management encourages the investment of resources both monetary and non-monetary fully contributing to the more achievement of the current administration.
TMS 3	Top management focuses on the improvement, development, and change of available systems to provide consistent with the situation in the future to increase the goal achievement very well.
TMS 4	Top management support employees to participate in the operation and problem-solving of the organization to fully enhance the efficiency and effectiveness of operations.
<b>Organizational Learning Dynamism (OLD)</b>	
OLD 1	Firm strongly believes that continuous learning organization to help build to be potential and can survive in the competition continuously.
OLD 2	Firm emphasizes studies and focuses on understanding a variety of firm's external environments continuously to cause to increase the ability of organizational development evenly.
OLD 3	Firm encourages the combination of techniques, methods or new technologies in the business operation continuously for enhancing competitiveness even better.
OLD 4	Firm encourages employees to participate in the training and development of new knowledge continuously to contribute to the success of the operation increasingly.
OLD 5	Firm pushes for the exchange of knowledge of employees to help achieve maximum effectiveness and efficiency.
<b>Best Management Accounting System (MAS)</b>	
MAS 1	Firm is confident that the best management accounting system can make the presentation of information for decision-making to be more effective.
MAS 2	Firm focuses on the concrete development of management accounting system is substantial because it enables accounting information can be extremely utilized.
MAS 3	Firm emphasizes to apply the technologies of management accounting to aid the presentation of data in accordance with the situation.



Table 1A: Original Items in Scales (continued)

Construct	Items
<b>Best Management Accounting System (MAS)</b>	
MAS 4	Firm always recognizes that the best accounting management system to respond the needs and enables executives to be able to plan operations, both in the present and in the future very well.
<b>Information Technology Complementarity (ITC)</b>	
ITC 1	Currently, information technology is more growth, resulting in firms need to improve and develop itself to be able to apply such technologies more efficiently.
ITC 2	Information technology is diverse and cheaper down so firms can select the use of information technologies that there are appropriate with the operational strategy of each business.
ITC 3	The development of information technology systems occurs continuously, so firms need to emphasize to improve and develop them to increase their efficiency.
ITC 4	Currently, information technology is more modern, so firms can operate more quickly and reduce errors in the operation very well.
<b>Competitive Environment Intensity (CEI)</b>	
CEI 1	Currently, business environments are increasingly volatile, so firms need to track such environmental changes all the time.
CEI 2	When marketing factors that relate to business operations is very diverse, firms usually focus on building capacity and competitiveness continuously.
CEI 3	Currently, competition is extremely fierce both domestic and foreign, so firms focus on the creation and development of management capability continually.
CEI 4	Customers have various demands to result in firms must focus on responding to the needs even more effectively.
<b>Accounting Competency (AC)</b>	
AC 1	Firm believes that the potentiality and capabilities of accounting enable the administration to achieve its goals well.
AC 2	Firm focuses on the development of knowledge and skills of accountants continuously, thereby causing the potential for even more functionality.
AC 3	Firm focuses on the concrete development of accounting systems and technologies for helping the higher accounting performance of the firm.
AC 4	Firm always realizes that the organization's potentiality and capabilities of accounting to will support the goal achievement in the present and the future.



## **APPENDIX B**

### **Item Factor Loadings and Reliability Analyses in Pre-Test**



Table 1B: Item Factor Loadings and Reliability Analyses in Pre-Test<sup>a</sup>

Constructs	Items	Factor Loadings	Reliability (Alpha)
Firm Success (FSC)	FSC 1	0.856	0.941
	FSC 2	0.900	
	FSC 3	0.942	
	FSC 4	0.904	
	FSC 5	0.895	
Market Value-Based Appraisal Orientation (MBAO)	MBAO 1	0.879	0.926
	MBAO 2	0.958	
	MBAO 3	0.893	
	MBAO 4	0.896	
Accounting-Oriented Measurement Capability (AOMC)	AOMC 1	0.775	0.873
	AOMC 2	0.900	
	AOMC 3	0.832	
	AOMC 4	0.906	
Indicator-Based Assessment Focus (IBAF)	IBAF 1	0.783	0.867
	IBAF 2	0.805	
	IBAF 3	0.930	
	IBAF 4	0.883	
Value-Added Evaluation Emphasis (VAEE)	VAEE 1	0.800	0.830
	VAEE 2	0.848	
	VAEE 3	0.832	
	VAEE 4	0.786	
Revenue-Oriented Criterion Implementation (ROCI)	ROCI 1	0.834	0.877
	ROCI 2	0.914	
	ROCI 3	0.924	
	ROCI 4	0.818	

<sup>a</sup> n = 30



Table 1B: Item Factor Loadings and Reliability Analyses in Pre-Testa (continued)

Constructs	Items	Factor Loadings	Reliability (Alpha)
Sustainable Organizational Commitment (SOC)	SOC 1	0.910	0.923
	SOC 2	0.932	
	SOC 3	0.919	
	SOC 4	0.794	
	SOC 5	0.823	
Organizational Citizenship Behavior (OCB)	OCB 1	0.912	0.917
	OCB 2	0.931	
	OCB 3	0.834	
	OCB 4	0.801	
	OCB 5	0.876	
Continuous Organizational Loyalty (COL)	COL 1	0.851	0.915
	COL 2	0.841	
	COL 3	0.888	
	COL 4	0.828	
	COL 5	0.917	
Organizational Competitiveness (OC)	OC 1	0.804	0.896
	OC 2	0.865	
	OC 3	0.903	
	OC 4	0.829	
	OC 5	0.801	
Top Management Support (TMS)	TMS 1	0.901	0.903
	TMS 2	0.886	
	TMS 3	0.925	
	TMS 4	0.819	
Organizational Learning Dynamism (OLD)	OLD 1	0.842	0.918
	OLD 2	0.893	

<sup>a</sup> n = 30

Table 1B: Item Factor Loadings and Reliability Analyses in Pre-Testa (continued)

Constructs	Items	Factor Loadings	Reliability (Alpha)
Organizational Learning Dynamism (OLD)	OLD 3	0.911	
	OLD 4	0.830	
	OLD 5	0.866	
Best Management Accounting System (MAS)	MAS 1	0.957	0.935
	MAS 2	0.954	
	MAS 3	0.913	
	MAS 4	0.858	
Information Technology Complementarity (ITC)	ITC 1	0.945	0.958
	ITC 2	0.943	
	ITC 3	0.938	
	ITC 4	0.944	
Competitive Environment Intensity (CEI)	CEI 1	0.902	0.907
	CEI 2	0.921	
	CEI 3	0.895	
	CEI 4	0.826	
Accounting Competency (AC)	AC 1	0.948	0.904
	AC 2	0.859	
	AC 3	0.909	
	AC 4	0.806	

<sup>a</sup> n = 30



**APPENDIX C**  
**Key Participant Characteristics**



Table 1C: Key Participant Characteristics

Description	Categories	Frequencies	Percentage (%)
1. Gender	Male	45	29.41
	Female	108	70.59
	Total	153	100.00
2. Age	Less than 30 years old	4	2.61
	30-40 years old	53	34.64
	41-50 years old	61	39.87
	More than 50 years old	35	22.88
	Total	153	100.00
3. Marital status	Single	65	42.48
	Married	83	54.25
	Divorced	5	3.27
	Total	153	100.00
4. Education levels	Bachelor's degree or lower	59	38.56
	Higher than Bachelor's degree	94	61.44
	Total	153	100.00
5. Working experience	Less than 5 years	9	5.88
	5-10 years	13	8.50
	11-15 years	36	23.53
	More than 15 years	95	62.09
	Total	153	100.00
6. Average revenues per month	Less than 100,000 Baht	71	46.41
	100,000-125,000 Baht	31	20.26
	125,001-150,000 Baht	18	11.76
	More than 150,000 Baht	33	21.57
	Total	153	100.00
7. Working positions	Accounting Director	51	33.33
	Accounting Manager	84	54.90
	Other position	18	11.77
	Total	153	100.00



**APPENDIX D**  
**Demographic of Firm Characteristics**



Table 1D: Demographic Characteristics of Thai-listed firms

Descriptions	Categories	Frequencies	Percentage (%)
1. Type of business	Agro and Food Industry	14	9.15
	Consumer Products	4	2.61
	Financials	10	6.54
	Industrials	29	18.95
	Property and Constructions	40	26.14
	Resources	17	11.11
	Technology	32	20.92
	Services	5	3.27
	Others	2	1.31
	Total	153	100.00
2. The period of time registered in the Stock Exchange of Thailand	Less than 5 years	39	25.49
	5 - 10 years	26	16.99
	11- 15 years	24	15.69
	More than 15 years	64	41.83
	Total	153	100.00
3. The period of time in operating business	Less than 5 years	4	2.62
	5 - 10 years	9	5.88
	11- 15 years	14	9.15
	More than 15 years	126	82.35
	Total	153	100.00
4. Authorized capitals (Baht)	Less than 1,000,000,000	92	60.13
	1,000,000,000 – 5,000,000,000	35	22.88
	5,000,000,001 – 9,000,000,000	8	5.23
	More than 9,000,000,000	18	11.76
	Total	153	100.00



Table 1D: Demographic Characteristics of Thai-listed firms (continued)

Descriptions	Categories	Frequencies	Percentage (%)
5. The total assets of the firm (baht)	Less than 10,000,000,000	95	62.09
	10,000,000,000 – 50,000,000,000	29	18.96
	50,000,000,001 – 90,000,000,000	9	5.88
	More than 90,000,000,000	20	13.07
	Total	153	100.00
6. Number of employees	Less than 50	12	7.84
	50 - 100	10	6.54
	101 – 150	12	7.84
	More than 150	119	77.78
	Total	153	100.00
7. Average revenues per year (baht)	Less than 100,000,000	9	5.88
	100,000,000 – 500,000,000	22	14.38
	500,000,001 – 900,000,000	27	17.65
	More than 900,000,000	95	62.09
	Total	153	100.00



## **APPENDIX E**

### **Non-Response Bias Tests**





Table 1E: Non-Response Bias Tests

Comparison	N	Mean	S.D.	t	p-value
<b>The period of time registered in the Stock exchange of Thailand:</b>	153				
• First Group	77	2.81	1.267	0.665	0.725
• Second Group	76	2.67	1.226		
<b>The period of time in operating business:</b>	153				
• First Group	77	3.69	0.765	-0.431	0.279
• Second Group	76	3.74	0.619		
<b>Authorized capitals (baht):</b>	153				
• First Group	77	1.79	1.080	1.301	0.149
• Second Group	76	1.58	0.942		
<b>The total assets of the firm:</b>	153				
• First Group	77	1.73	1.096	0.328	0.430
• Second Group	76	1.67	1.025		
<b>Average revenues per year:</b>	153				
• First Group	77	3.31	1.003	-0.634	0.244
• Second Group	76	3.41	0.867		

\*\*  $p < 0.05$



## **APPENDIX F**

### **Test the Assumption of Regression Analysis**



## **Appendix F- Results of testing the basic assumption of regression analysis**

Regression analysis (OLS) is used to test the interrelationship between the various independent and dependent variables by SPSS program. From the relation model and the hypotheses, the following 16 equation models are presented including assumptions of regression model as follows: 1) Linearity of phenomenon measured, 2) Constant variance of the error terms (Homoscedasticity), 3) Normality of the error term distribution, 4) Independence of the error terms, and 5) Test of Multicollinearity. The results of testing are shown as follow:

### **1. Linearity of phenomenon measured**

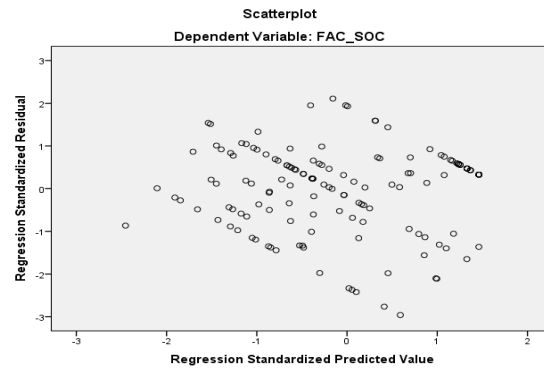
Linearity is an statistical agreement about the relationship between independent variables and dependent variable whether the relationships are linear in nature or not. If the relationship between independent variables and the dependent variable is not linear, the results of the regression analysis will under-estimate the true relationship. The linearity of the dependent – independent variables relationship describes the degree change in the dependent variable as related to the independent variable. A preferable method of detection is an examination of residual plots is used (plots of standardized residuals as a function of standardized predicted values, readily available in most statistical software). The results of linearity testing do not demonstrate any nonlinear pattern to the residuals. Thus, the relationships between dependent variable and independent variables of each model are linearity.

### **2. Test of constant variance of the error terms (Homoscedasticity)**

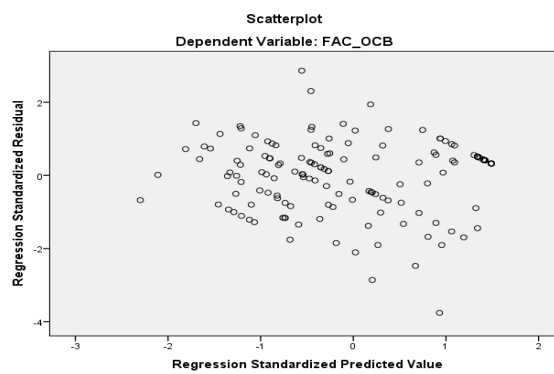
Homoscedasticity means that the variance of errors is the same cross all levels of the independent variables. This research is checked by visual examination of a plot of the standardized residuals by regression standardized predicted value. Ideally, residuals are randomly scattered around 0 (the horizontal line) providing a relatively even distribution. Heteroscedasticity is indicated when the residuals are not evenly scattered around the line. This research shows the scatterplot of residuals are randomly scattered around 0 (the horizontal line). Hence, heteroscedasticity may not be a serious problem for this research. The following shows the residual plots for linearity and constant variance of error terms testing.



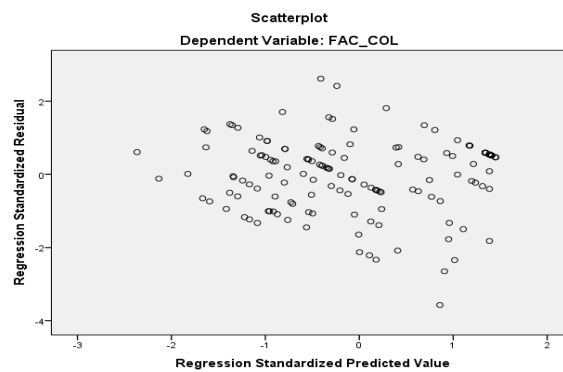
**Equation 1:**  $SOC = \alpha_{01} + \beta_1 MBAO + \beta_2 AOMC + \beta_3 IBAF + \beta_4 VAEE + \beta_5 ROCT + \beta_6 FA + \beta_7 FS + \epsilon$



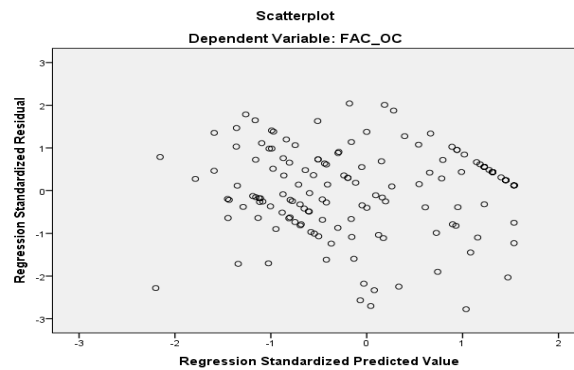
**Equation 2:**  $OCB = \alpha_{02} + \beta_8 MBAO + \beta_9 AOMC + \beta_{10} IBAF + \beta_{11} VAEE + \beta_{12} ROCT + \beta_{13} FA + \beta_{14} FS + \epsilon$



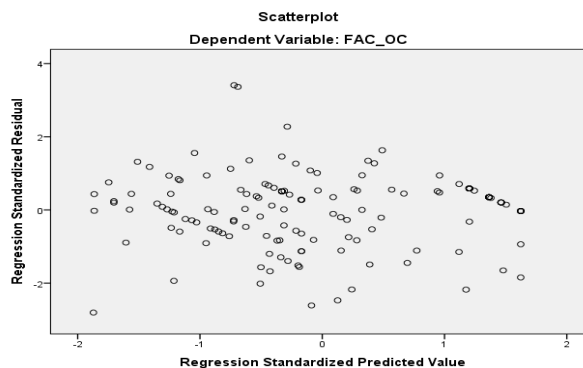
**Equation 3:**  $COL = \alpha_{03} + \beta_{15} MBAO + \beta_{16} AOMC + \beta_{17} IBAF + \beta_{18} VAEE + \beta_{19} ROCT + \beta_{20} FA + \beta_{21} FS + \epsilon$



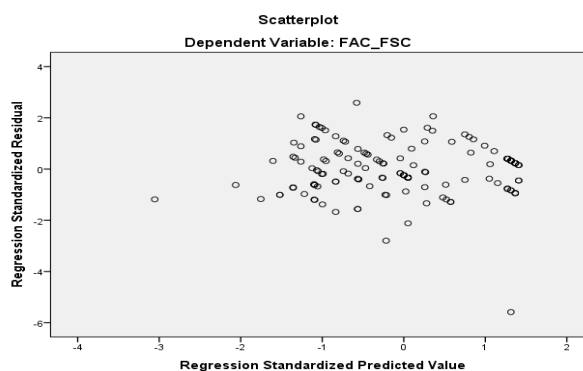
**Equation 4:**  $OC = \alpha_{04} + \beta_{22} MBAO + \beta_{23} AOMC + \beta_{24} IBAF + \beta_{25} VAEE + \beta_{26} ROCT + \beta_{27} FA + \beta_{28} FS + \epsilon$



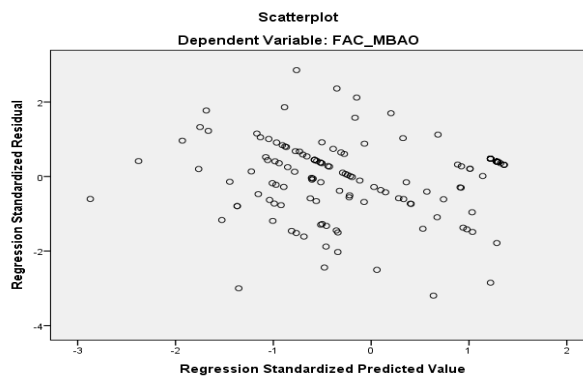
**Equation 5:**  $OC = \alpha_{05} + \beta_{29}SOC + \beta_{30}OCB + \beta_{31}COL + \beta_{32}FA + \beta_{33}FS + \epsilon$



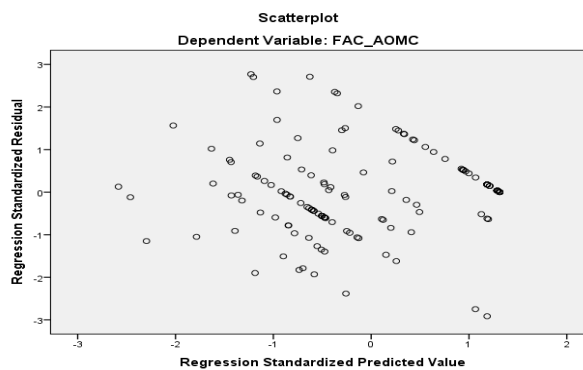
**Equation 6:**  $FSC = \alpha_{06} + \beta_{34}OC + \beta_{35}FA + \beta_{36}FS + \epsilon$



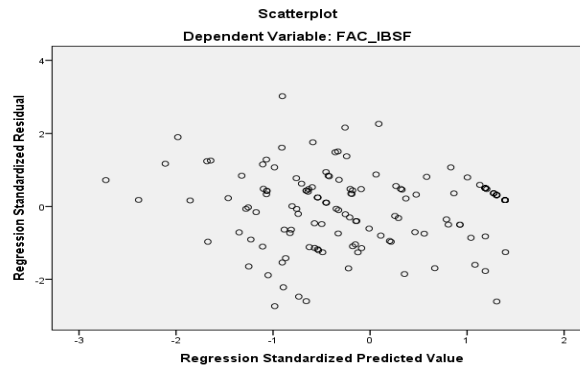
**Equation 7:**  $MBAO = \alpha_7 + \beta_{37}TMS + \beta_{38}OLD + \beta_{39}MAS + \beta_{40}ITC + \beta_{41}CEI + \beta_{42}FA + \beta_{43}FS + \epsilon$



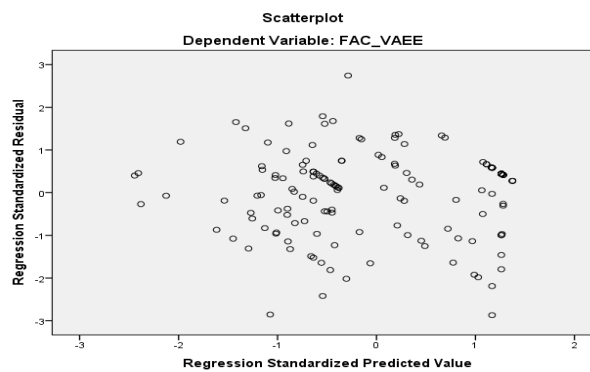
**Equation 8:**  $AOMC = \alpha_8 + \beta_{44}TMS + \beta_{45}OLD + \beta_{46}MAS + \beta_{47}ITC + \beta_{48}CEI + \beta_{49}FA + \beta_{50}FS + \epsilon$



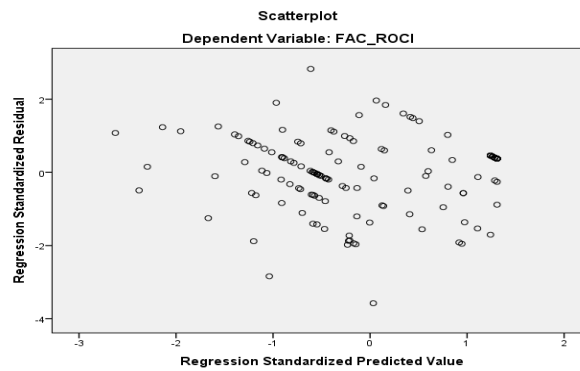
**Equation 9:**  $IBAF = \alpha_9 + \beta_{51}TMS + \beta_{52}OLD + \beta_{53}MAS + \beta_{54}ITC + \beta_{55}CEI + \beta_{56}FA + \beta_{57}FS + \varepsilon$



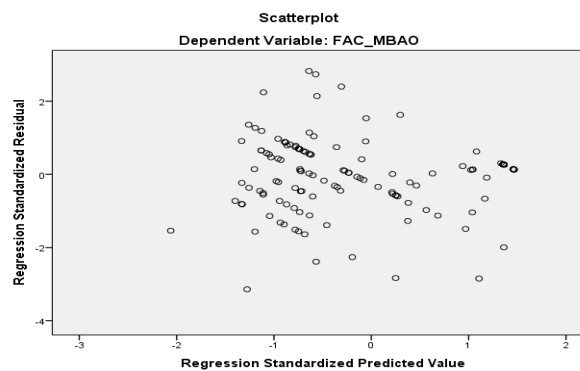
**Equation 10:**  $VAEE = \alpha_{10} + \beta_{58}TMS + \beta_{59}OLD + \beta_{60}MAS + \beta_{61}ITC + \beta_{62}CEI + \beta_{63}FA + \beta_{64}FS + \varepsilon$



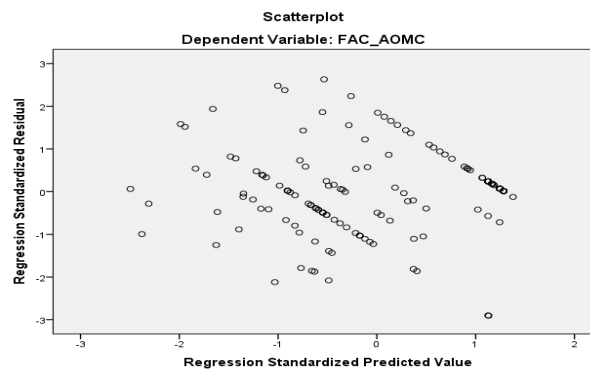
**Equation 11:**  $ROCI = \alpha_{11} + \beta_{65}TMS + \beta_{66}OLD + \beta_{67}MAS + \beta_{68}ITC + \beta_{69}CEI + \beta_{70}FA + \beta_{71}FS + \varepsilon$



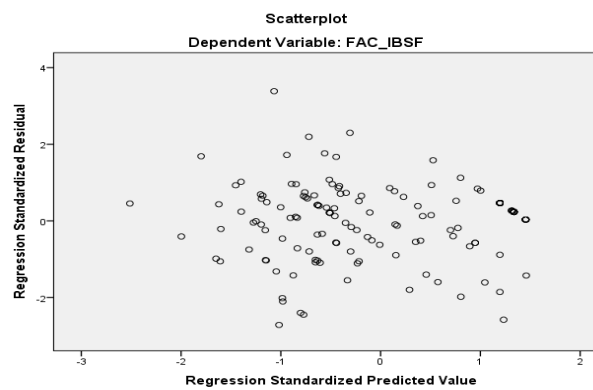
**Equation 12:**  $MBAO = \alpha_{12} + \beta_{72}TMS + \beta_{73}OLD + \beta_{74}MAS + \beta_{75}ITC + \beta_{76}CEI + \beta_{77}AC + \beta_{78}(TMS * AC) + \beta_{79}(OLD * AC) + \beta_{80}(MAS * AC) + \beta_{81}(ITC * AC) + \beta_{82}(CEI * AC) + \beta_{83}FA + \beta_{84}FS + \varepsilon$



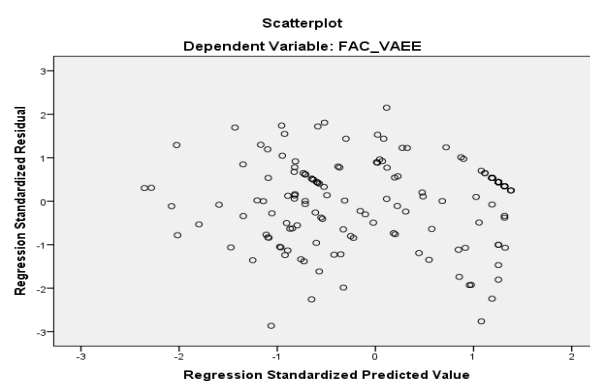
**Equation 13:** 
$$AOMC = \alpha_{13} + \beta_{85}TMS + \beta_{86}OLD + \beta_{87}MAS + \beta_{88}ITC + \beta_{89}CEI + \beta_{90}AC + \beta_{91}(TMS * AC) + \beta_{92}(OLD * AC) + \beta_{93}(MAS * AC) + \beta_{94}(ITC * AC) + \beta_{95}(CEI * AC) + \beta_{96}FA + \beta_{97}FS + \varepsilon$$



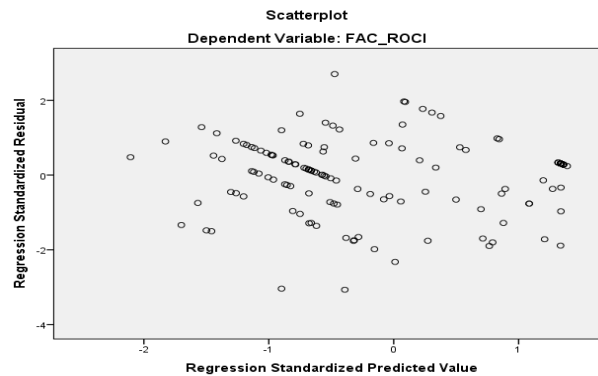
**Equation 14:** 
$$IBAF = \alpha_{14} + \beta_{98}TMS + \beta_{99}OLD + \beta_{100}MAS + \beta_{101}ITC + \beta_{102}CEI + \beta_{103}AC + \beta_{104}(TMS * AC) + \beta_{105}(OLD * AC) + \beta_{106}(MAS * AC) + \beta_{107}(ITC * AC) + \beta_{108}(CEI * AC) + \beta_{109}FA + \beta_{110}FS + \varepsilon$$



**Equation 15:** 
$$VAEE = \alpha_{15} + \beta_{111}TMS + \beta_{112}OLD + \beta_{113}MAS + \beta_{114}ITC + \beta_{115}CEI + \beta_{116}AC + \beta_{117}(TMS * AC) + \beta_{118}(OLD * AC) + \beta_{119}(MAS * AC) + \beta_{120}(ITC * AC) + \beta_{121}(CEI * AC) + \beta_{122}FA + \beta_{123}FS + \varepsilon$$



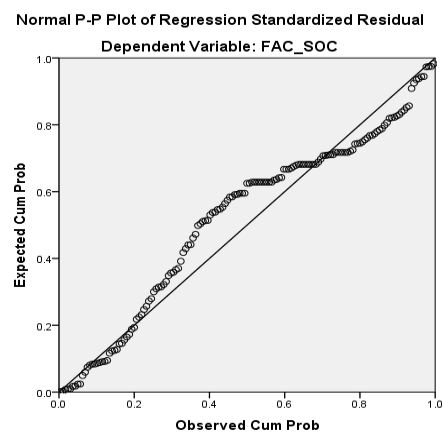
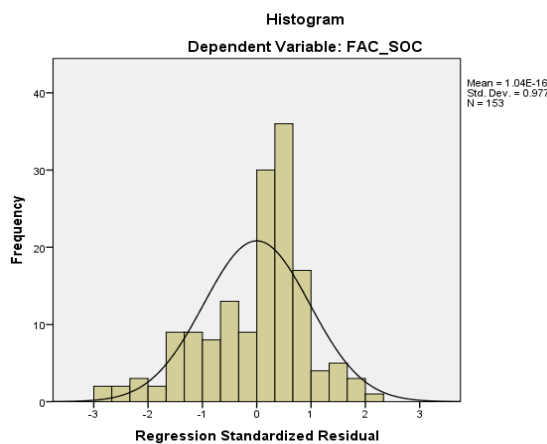
**Equation 16:** 
$$ROCI = \alpha_{16} + \beta_{124}TMS + \beta_{125}OLD + \beta_{126}MAS + \beta_{127}ITC + \beta_{128}CEI + \beta_{129}AC + \beta_{130}(TMS*AC) + \beta_{131}(OLD*AC) + \beta_{132}(MAS*AC) + \beta_{133}(ITC*AC) + \beta_{134}(CEI*AC) + \beta_{135}FA + \beta_{136}FS + \epsilon$$



### 3. Normality of the error term distribution

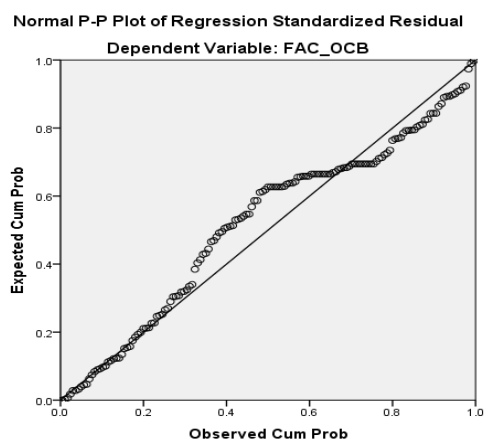
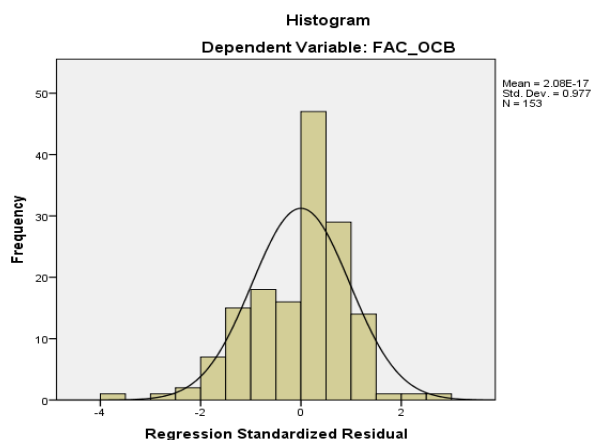
The normal probability plot of the residuals and the histogram of residuals are used to check the normality of error term distribution. “The normal distribution makes a straight diagonal line, and the plotter residuals are compared with the diagonal. If a distribution is normal, the residual line closely follows the diagonal” (Hair et al., 2010, p.185). As shown in the following, the values fall along the diagonal with no systematic departures. Therefore, the assumption of normality is met. As a result, the non-normality problems should not be concerned.

**Equation 1:** 
$$SOC = \alpha_{01} + \beta_1MBAO + \beta_2AOMC + \beta_3IBAF + \beta_4VAEE + \beta_5ROCT + \beta_6FA + \beta_7FS + \epsilon$$

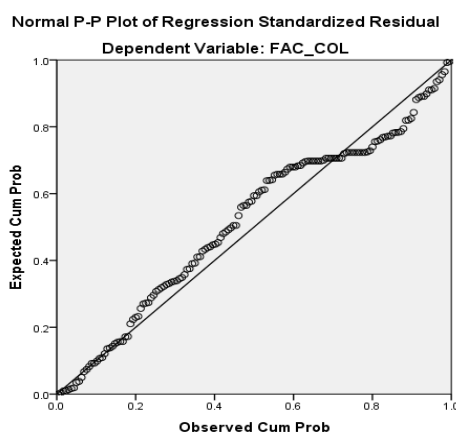
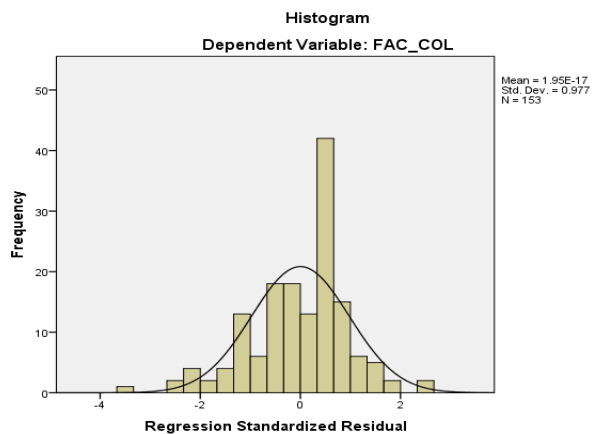




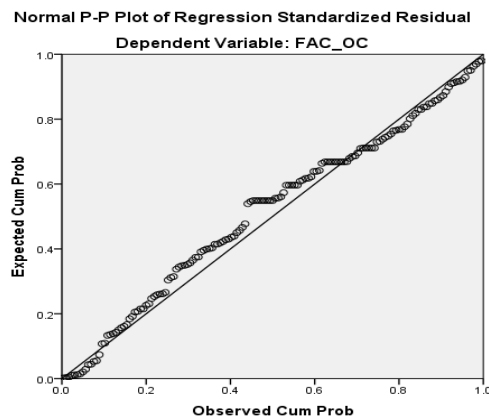
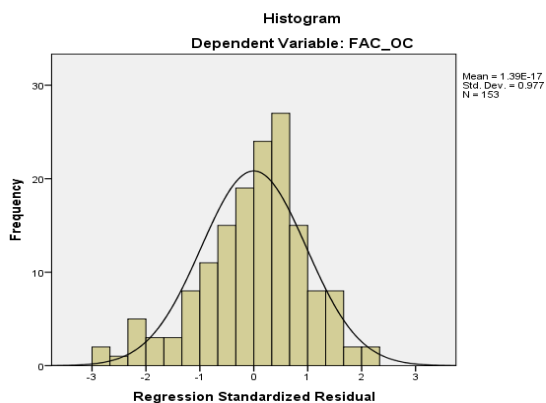
**Equation 2:**  $OCB = \alpha_{02} + \beta_8 MBAO + \beta_9 AOMC + \beta_{10} IBAF + \beta_{11} VAEE + \beta_{12} ROCT + \beta_{13} FA + \beta_{14} FS + \varepsilon$



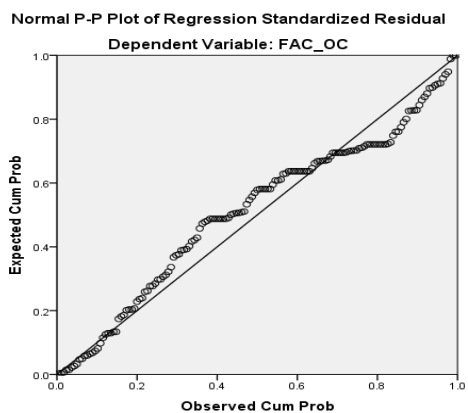
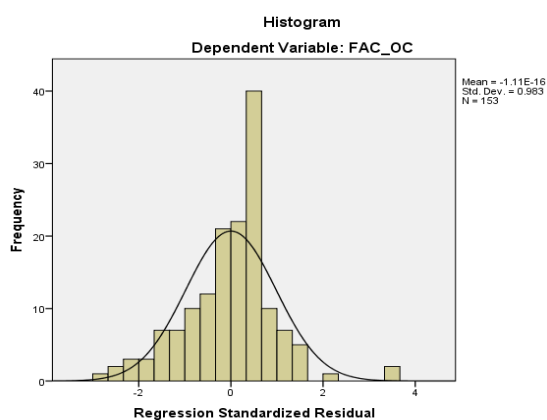
**Equation 3:**  $COL = \alpha_{03} + \beta_{15} MBAO + \beta_{16} AOMC + \beta_{17} IBAF + \beta_{18} VAEE + \beta_{19} ROCT + \beta_{20} FA + \beta_{21} FS + \varepsilon$



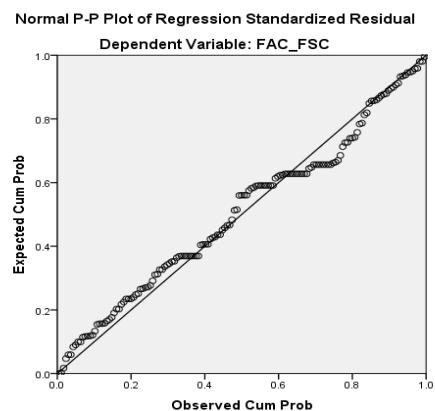
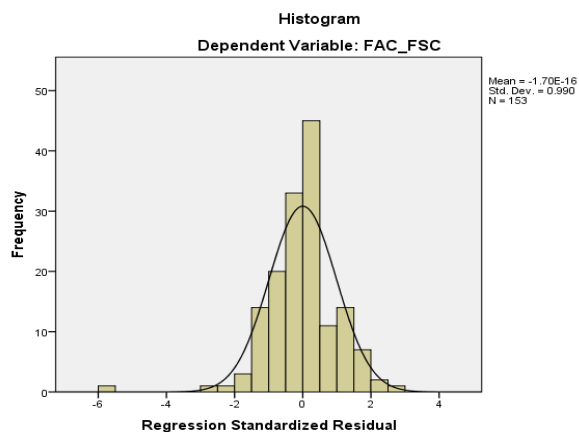
**Equation 4:**  $OC = \alpha_{04} + \beta_{22} MBAO + \beta_{23} AOMC + \beta_{24} IBAF + \beta_{25} VAEE + \beta_{26} ROCT + \beta_{27} FA + \beta_{28} FS + \varepsilon$



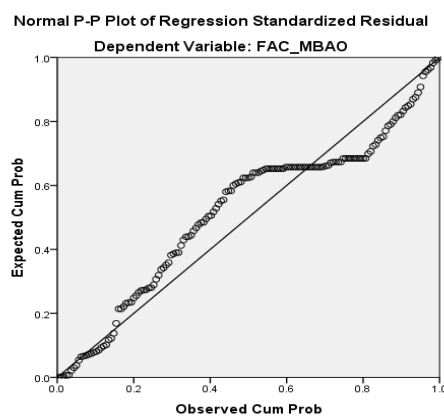
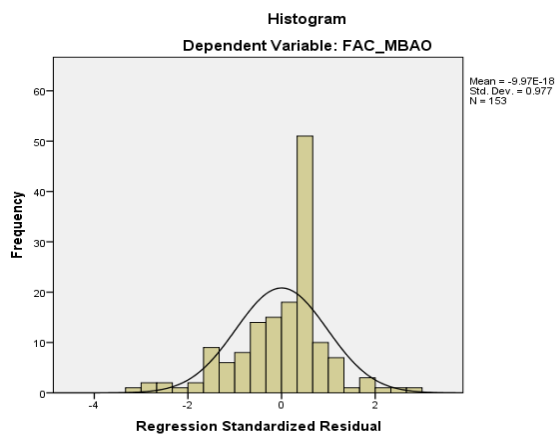
**Equation 5:**  $OC = \alpha_{05} + \beta_{29}SOC + \beta_{30}OCB + \beta_{31}COL + \beta_{32}FA + \beta_{33}FS + \varepsilon$



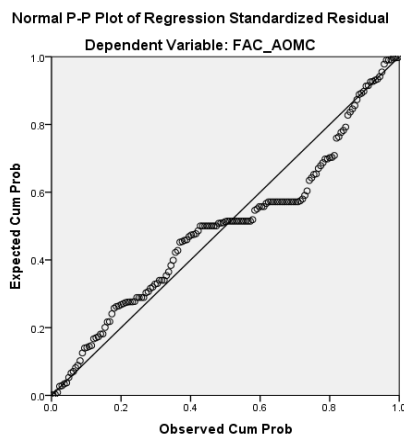
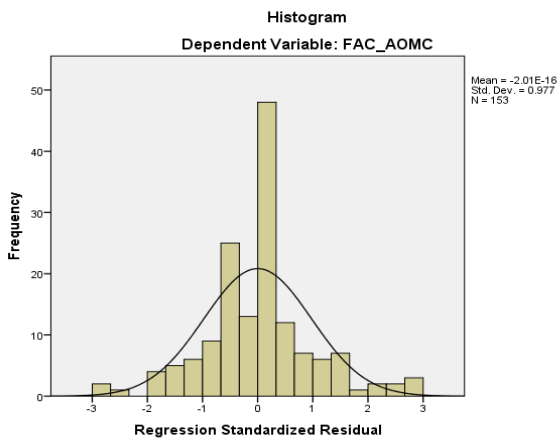
**Equation 6:**  $FSC = \alpha_{06} + \beta_{34}OC + \beta_{35}FA + \beta_{36}FS + \varepsilon$



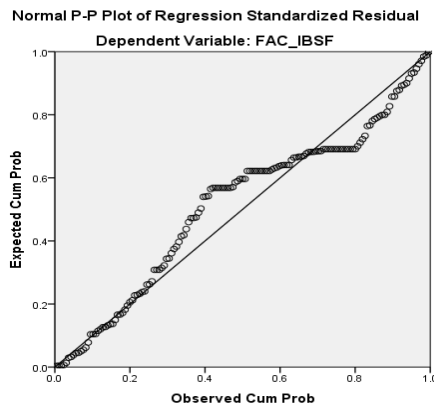
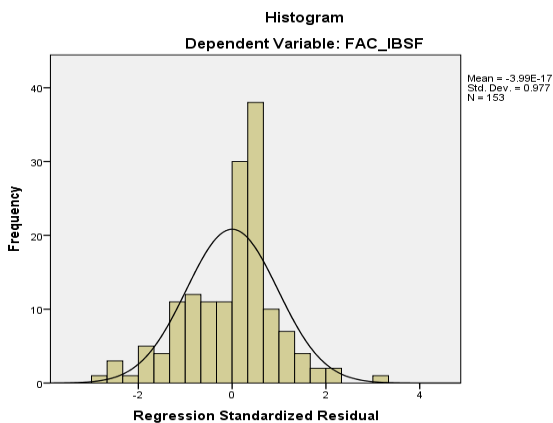
**Equation 7:**  $MBAO = \alpha_7 + \beta_{37}TMS + \beta_{38}OLD + \beta_{39}MAS + \beta_{40}ITC + \beta_{41}CEI + \beta_{42}FA + \beta_{43}FS + \varepsilon$



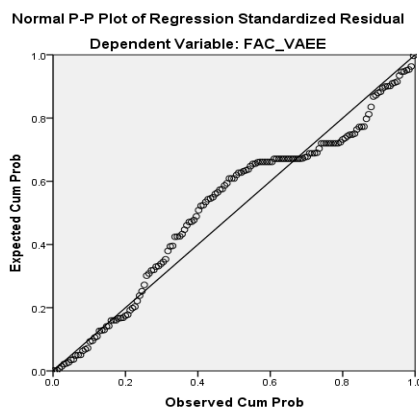
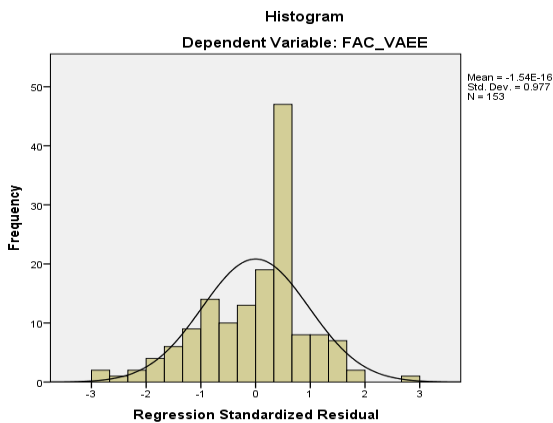
**Equation 8:**  $AOMC = \alpha_8 + \beta_{44}TMS + \beta_{45}OLD + \beta_{46}MAS + \beta_{47}ITC + \beta_{48}CEI + \beta_{49}FA + \beta_{50}FS + \varepsilon$



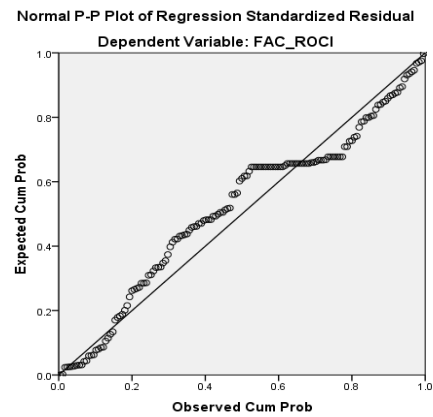
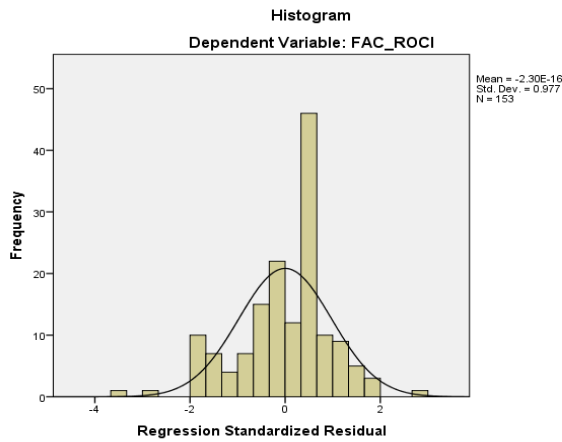
**Equation 9:**  $IBAF = \alpha_9 + \beta_{51}TMS + \beta_{52}OLD + \beta_{53}MAS + \beta_{54}ITC + \beta_{55}CEI + \beta_{56}FA + \beta_{57}FS + \varepsilon$



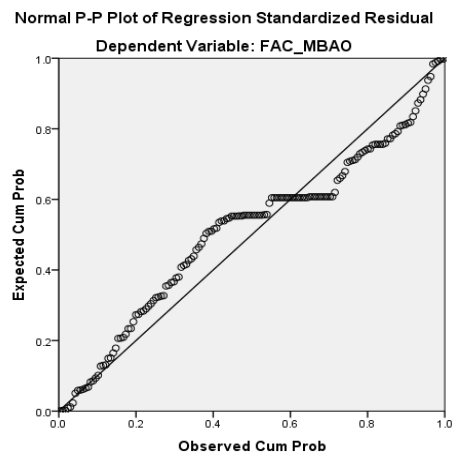
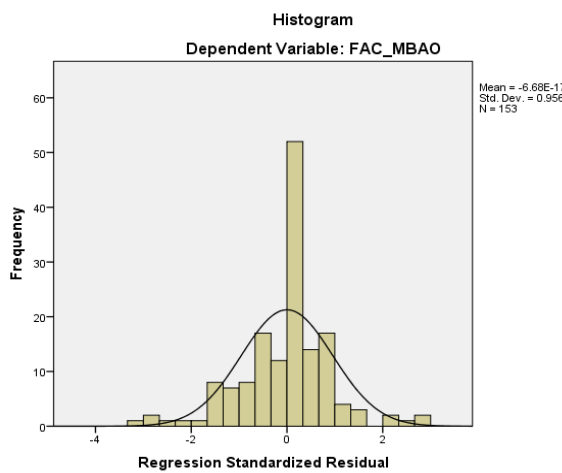
**Equation 10:**  $VAEE = \alpha_{10} + \beta_{58}TMS + \beta_{59}OLD + \beta_{60}MAS + \beta_{61}ITC + \beta_{62}CEI + \beta_{63}FA + \beta_{64}FS + \varepsilon$



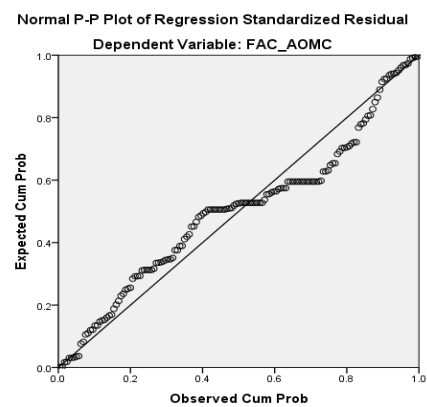
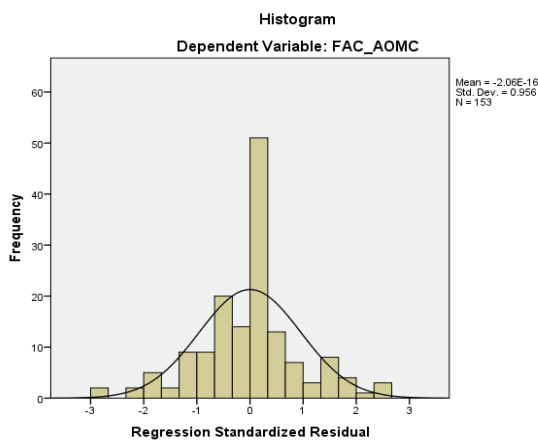
**Equation 11:**  $ROCI = \alpha_{11} + \beta_{65}TMS + \beta_{66}OLD + \beta_{67}MAS + \beta_{68}ITC + \beta_{69}CEI + \beta_{70}FA + \beta_{71}FS + \varepsilon$



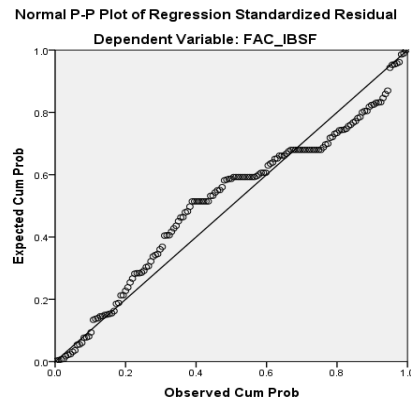
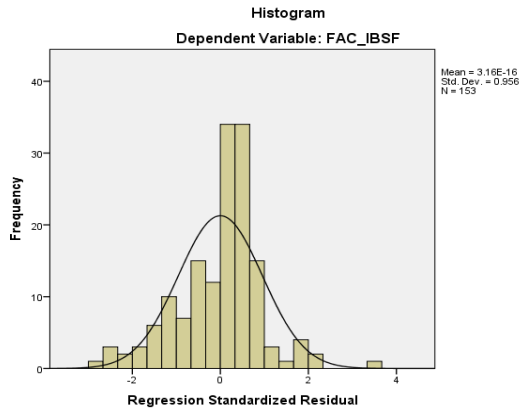
**Equation 12:**  $MBAO = \alpha_{12} + \beta_{72}TMS + \beta_{73}OLD + \beta_{74}MAS + \beta_{75}ITC + \beta_{76}CEI + \beta_{77}AC + \beta_{78}(TMS * AC) + \beta_{79}(OLD * AC) + \beta_{80}(MAS * AC) + \beta_{81}(ITC * AC) + \beta_{82}(CEI * AC) + \beta_{83}FA + \beta_{84}FS + \varepsilon$



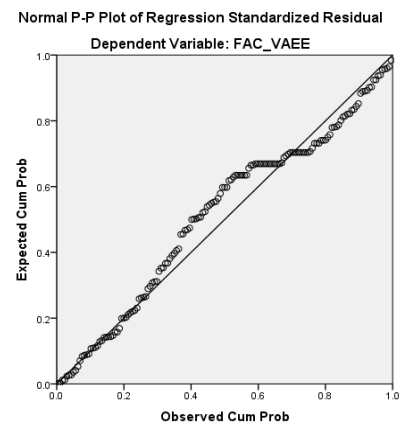
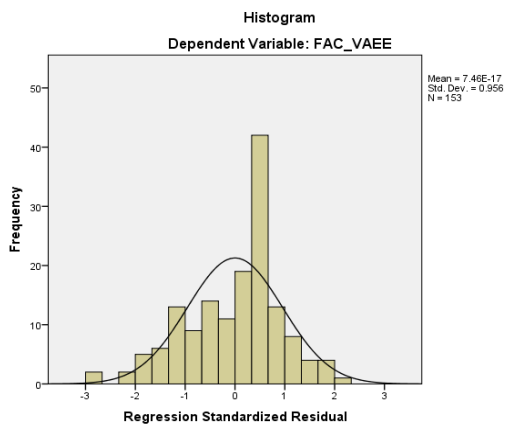
**Equation 13:**  $AOMC = \alpha_{13} + \beta_{85}TMS + \beta_{86}OLD + \beta_{87}MAS + \beta_{88}ITC + \beta_{89}CEI + \beta_{90}AC + \beta_{91}(TMS * AC) + \beta_{92}(OLD * AC) + \beta_{93}(MAS * AC) + \beta_{94}(ITC * AC) + \beta_{95}(CEI * AC) + \beta_{96}FA + \beta_{97}FS + \varepsilon$



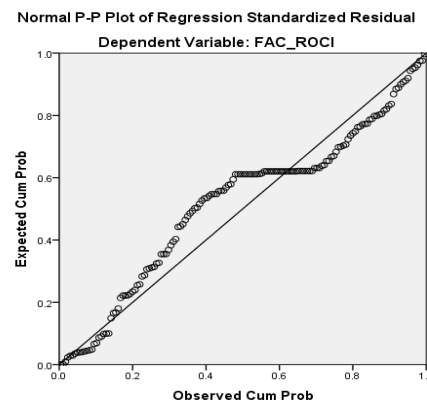
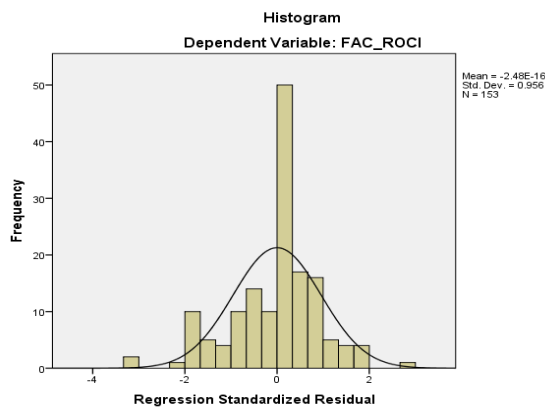
**Equation 14:** 
$$IBAF = \alpha_{14} + \beta_{98}TMS + \beta_{99}OLD + \beta_{100}MAS + \beta_{101}ITC + \beta_{102}CEI + \beta_{103}AC + \beta_{104}(TMS * AC) + \beta_{105}(OLD * AC) + \beta_{106}(MAS * AC) + \beta_{107}(ITC * AC) + \beta_{108}(CEI * AC) + \beta_{109}FA + \beta_{110}FS + \varepsilon$$



**Equation 15:** 
$$VAEE = \alpha_{15} + \beta_{111}TMS + \beta_{112}OLD + \beta_{113}MAS + \beta_{114}ITC + \beta_{115}CEI + \beta_{116}AC + \beta_{117}(TMS * AC) + \beta_{118}(OLD * AC) + \beta_{119}(MAS * AC) + \beta_{120}(ITC * AC) + \beta_{121}(CEI * AC) + \beta_{122}FA + \beta_{123}FS + \varepsilon$$



**Equation 16:** 
$$ROCI = \alpha_{16} + \beta_{124}TMS + \beta_{125}OLD + \beta_{126}MAS + \beta_{127}ITC + \beta_{128}CEI + \beta_{129}AC + \beta_{130}(TMS * AC) + \beta_{131}(OLD * AC) + \beta_{132}(MAS * AC) + \beta_{133}(ITC * AC) + \beta_{134}(CEI * AC) + \beta_{135}FA + \beta_{136}FS + \varepsilon$$



#### 4. Test independence of the error terms (Test of Autocorrelation)

Test independence of the error terms is used Durbin-Watson to test, which data problem is often time series data or cross-sectional data. The rule of thumb of Durbin-Watson d statistic has a value between 1.5 to 2.5 is no autocorrelation. From the results of Durbin-Watson d statistics, d statistics are about 1.828– 2.305. Hence, it could be assumed that the error terms are independence.

Table 1F: The results of the independence of error terms assumption testing

Equations	Durbin-Watson (d Statistics)
Equation 1: $SOC = \alpha_{01} + \beta_1 MBAO + \beta_2 AOMC + \beta_3 IBAF + \beta_4 VAEE + \beta_5 ROCT + \beta_6 FA + \beta_7 FS + \varepsilon$	2.305
Equation 2: $OCB = \alpha_{02} + \beta_8 MBAO + \beta_9 AOMC + \beta_{10} IBAF + \beta_{11} VAEE + \beta_{12} ROCT + \beta_{13} FA + \beta_{14} FS + \varepsilon$	1.982
Equation 3: $COL = \alpha_{03} + \beta_{15} MBAO + \beta_{16} AOMC + \beta_{17} IBAF + \beta_{18} VAEE + \beta_{19} ROCT + \beta_{20} FA + \beta_{21} FS + \varepsilon$	2.239
Equation 4: $OC = \alpha_{04} + \beta_{22} MBAO + \beta_{23} AOMC + \beta_{24} IBAF + \beta_{25} VAEE + \beta_{26} ROCT + \beta_{27} FA + \beta_{28} FS + \varepsilon$	1.895
Equation 5: $OC = \alpha_{05} + \beta_{29} SOC + \beta_{30} OCB + \beta_{31} COL + \beta_{32} FA + \beta_{33} FS + \varepsilon$	1.828
Equation 6: $FSC = \alpha_{06} + \beta_{34} OC + \beta_{35} FA + \beta_{36} FS + \varepsilon$	1.852
Equation 7: $MBAO = \alpha_7 + \beta_{37} TMS + \beta_{38} OLD + \beta_{39} MAS + \beta_{40} ITC + \beta_{41} CEI + \beta_{42} FA + \beta_{43} FS + \varepsilon$	1.926
Equation 8: $AOMC = \alpha_8 + \beta_{44} TMS + \beta_{45} OLD + \beta_{46} MAS + \beta_{47} ITC + \beta_{48} CEI + \beta_{49} FA + \beta_{50} FS + \varepsilon$	2.094
Equation 9: $IBAF = \alpha_9 + \beta_{51} TMS + \beta_{52} OLD + \beta_{53} MAS + \beta_{54} ITC + \beta_{55} CEI + \beta_{56} FA + \beta_{57} FS + \varepsilon$	1.863
Equation 10: $VAEE = \alpha_{10} + \beta_{58} TMS + \beta_{59} OLD + \beta_{60} MAS + \beta_{61} ITC + \beta_{62} CEI + \beta_{63} FA + \beta_{64} FS + \varepsilon$	2.096
Equation 11: $ROCI = \alpha_{11} + \beta_{65} TMS + \beta_{66} OLD + \beta_{67} MAS + \beta_{68} ITC + \beta_{69} CEI + \beta_{70} FA + \beta_{71} FS + \varepsilon$	2.112
Equation 12: $MBAO = \alpha_{12} + \beta_{72} TMS + \beta_{73} OLD + \beta_{74} MAS + \beta_{75} ITC + \beta_{76} CEI + \beta_{77} AC + \beta_{78} (TMS * AC) + \beta_{79} (OLD * AC) + \beta_{80} (MAS * AC) + \beta_{81} (ITC * AC) + \beta_{82} (CEI * AC) + \beta_{83} FA + \beta_{84} FS + \varepsilon$	1.904



Table 1F: The results of the independence of error terms assumption testing (continued)

Equations	Durbin-Watson (d Statistics)
$\text{Equation 13: } AOMC = \alpha_{13} + \beta_{85}TMS + \beta_{86}OLD + \beta_{87}MAS + \beta_{88}ITC + \beta_{89}CEI + \beta_{90}AC$ $+ \beta_{91}(TMS * AC) + \beta_{92}(OLD * AC) + \beta_{93}(MAS * AC) + \beta_{94}(ITC * AC) + \beta_{95}(CEI * AC) + \beta_{96}FA + \beta_{97}FS + \varepsilon$	2.111
$\text{Equation 14: } IBAF = \alpha_{14} + \beta_{98}TMS + \beta_{99}OLD + \beta_{100}MAS + \beta_{101}ITC + \beta_{102}CEI + \beta_{103}AC$ $+ \beta_{104}(TMS * AC) + \beta_{105}(OLD * AC) + \beta_{106}(MAS * AC) + \beta_{107}(ITC * AC) + \beta_{108}(CEI * AC) + \beta_{109}FA + \beta_{110}FS + \varepsilon$	1.840
$\text{Equation 15: } VAAE = \alpha_{15} + \beta_{111}TMS + \beta_{112}OLD + \beta_{113}MAS + \beta_{114}ITC + \beta_{115}CEI + \beta_{116}AC$ $+ \beta_{117}(TMS * AC) + \beta_{118}(OLD * AC) + \beta_{119}(MAS * AC) + \beta_{120}(ITC * AC) + \beta_{121}(CEI * AC) + \beta_{122}FA + \beta_{123}FS + \varepsilon$	2.086
$\text{Equation 16: } ROCI = \alpha_{16} + \beta_{124}TMS + \beta_{125}OLD + \beta_{126}MAS + \beta_{127}ITC + \beta_{128}CEI + \beta_{129}AC + \beta_{130}$ $(TMS * AC) + \beta_{131}(OLD * AC) + \beta_{132}(MAS * AC) + \beta_{133}(ITC * AC) + \beta_{134}(CEI * AC) + \beta_{135}FA + \beta_{136}FS + \varepsilon$	2.250

### 5. Test of Multicollinearity

The ideal situation for research would have a number of independent variables highly correlated with the dependent variable, but with little correlation among them. Multicollinearity will occur when any single independent variable is highly correlated with other independent variables. If the independent variables have highly correlated with themselves, it impacts to the result of regression analysis. Consequently, the result of regression analysis is not believable. In order to multicollinearity, this research uses Variance Inflation Factor (VIF). Hair et al. (2010) explain if VIF value is greater than 10, it might have multicollinearity. The VIF of each equation model is less than 10 implying that there is no multicollinearity.



Table 1G: The results of multicollinearity testing (IPMSS and its consequences)

Independent Variables	Dependents Variables											
	SOC		OCB		COL		OC		OC		FS	
	Equation 1		Equation 2		Equation 3		Equation 4		Equation 5		Equation 6	
	Tolerance	VIF	Tolerance	VIF	Tolerance	VIF	Tolerance	VIF	Tolerance	VIF	Tolerance	VIF
MBAO	.364	2.747	.364	2.747	.364	2.747	.364	2.747				
AOMC	.355	2.814	.355	2.814	.355	2.814	.355	2.814				
IBAF	.218	4.588	.218	4.588	.218	4.588	.218	4.588				
VAEE	.246	4.060	.246	4.060	.246	4.060	.246	4.060				
ROCI	.319	3.139	.319	3.139	.319	3.139	.319	3.139				
SOC									.179	5.572		
OCB									.166	6.030		
COL									.160	6.233		
OC											.954	1.048
Firm Age	.968	1.033	.968	1.033	.968	1.033	.968	1.033	.970	1.031	.982	1.019
Firm Size	.937	1.067	.937	1.067	.937	1.067	.937	1.067	.945	1.058	.944	1.059

Table 1H: The results of multicollinearity testing (IPMSS and its antecedences )

Independent Variables	Dependents Variables									
	MBAO		AOMC		IBAF		VAEE		ROCI	
	Equation 7		Equation 8		Equation 9		Equation 10		Equation 11	
	Tolerance	VIF	Tolerance	VIF	Tolerance	VIF	Tolerance	VIF	Tolerance	VIF
TMS	.239	4.189	.239	4.189	.239	4.189	.239	4.189	.239	4.189
OLD	.193	5.175	.193	5.175	.193	5.175	.193	5.175	.193	5.175
MAS	.199	5.032	.199	5.032	.199	5.032	.199	5.032	.199	5.032
ITC	.184	5.431	.184	5.431	.184	5.431	.184	5.431	.184	5.431
CEI	.354	2.825	.354	2.825	.354	2.825	.354	2.825	.354	2.825
Firm Age	.913	1.096	.913	1.096	.913	1.096	.913	1.096	.913	1.096
Firm Size	.938	1.066	.938	1.066	.938	1.066	.938	1.066	.938	1.066

Table 1I: The results of multicollinearity testing (IPMSS, its antecedences and Moderator)

Independent Variables	Dependents Variables									
	MBAO		AOMC		IBAF		VAEE		ROCI	
	Equation 12		Equation 13		Equation 14		Equation 15		Equation 16	
	Tolerance	VIF	Tolerance	VIF	Tolerance	VIF	Tolerance	VIF	Tolerance	VIF
TMS	.159	6.304	.159	6.304	.159	6.304	.159	6.304	.159	6.304
OLD	.157	6.368	.157	6.368	.157	6.368	.157	6.368	.157	6.368
MAS	.135	7.396	.135	7.396	.135	7.396	.135	7.396	.135	7.396
ITC	.112	8.919	.112	8.919	.112	8.919	.112	8.919	.112	8.919
CEI	.200	4.988	.200	4.988	.200	4.988	.200	4.988	.200	4.988
AC	.221	4.524	.221	4.524	.221	4.524	.221	4.524	.221	4.524
TMS*AC	.224	4.468	.224	4.468	.224	4.468	.224	4.468	.224	4.468
OLD*AC	.177	5.654	.177	5.654	.177	5.654	.177	5.654	.177	5.654
MAS*AC	.145	6.884	.145	6.884	.145	6.884	.145	6.884	.145	6.884
ITC*AC	.133	7.517	.133	7.517	.133	7.517	.133	7.517	.133	7.517
CEI*AC	.267	3.748	.267	3.748	.267	3.748	.267	3.748	.267	3.748
Firm Age	.882	1.134	.882	1.134	.882	1.134	.882	1.134	.882	1.134
Firm Size	.906	1.104	.906	1.104	.906	1.104	.906	1.104	.906	1.104





## **APPENDIX G**

### **Cover Letters and Questionnaire: Thai Version**





ที่ ศธ 0530.10/ 771

คณะกรรมการบัญชีและการจัดการ  
มหาวิทยาลัยมหาสารคาม  
อำเภอกันทรวิชัย จังหวัดมหาสารคาม  
44150

10 มิถุนายน 2559

เรื่อง ขอความอนุเคราะห์กรอกแบบสอบถาม

เรียน ผู้อำนวยการฝ่ายบัญชี/ผู้จัดการฝ่ายบัญชี

ด้วย นางพรรณราย ละตา นิสิตระดับปริญญาเอก คณะกรรมการบัญชีและการจัดการ มหาวิทยาลัยมหาสารคาม กำลังศึกษาวิทยานิพนธ์ เรื่อง “ กลยุทธ์ระบบการวัดผลการดำเนินงานแบบบูรณาการและความสำเร็จขององค์กร : การตรวจสอบเชิงประจักษ์บริษัทจดทะเบียนในตลาดหลักทรัพย์แห่งประเทศไทย ” ซึ่งเป็นส่วนหนึ่งของการทำวิทยานิพนธ์ หลักสูตรปรัชญาดุษฎีบัณฑิต (ปร.ด.) และการศึกษาในครั้งนี้ได้เน้นให้นักศึกษาข้อมูลด้วยตนเอง ดังนั้น เพื่อให้การจัดทำวิทยานิพนธ์เป็นไปด้วยความเรียบร้อยและบรรลุวัตถุประสงค์ คณะกรรมการบัญชีและการจัดการ มหาวิทยาลัยมหาสารคาม จึงใคร่ขออนุญาตให้ นางพรรณราย ละตา ศึกษาและเก็บรวบรวมในรายละเอียดตามแบบสอบถามที่แนบมาพร้อมนี้

คณะกรรมการบัญชีและการจัดการ มหาวิทยาลัยมหาสารคาม หวังเป็นอย่างยิ่งว่าจะได้รับความอนุเคราะห์จากท่านในการให้ข้อมูลในครั้งนี้ และขอขอบคุณมา ณ โอกาสนี้

ขอแสดงความนับถือ

(รองศาสตราจารย์ ดร.ปภังกร บารมี อุตสาหะวานิชกิจ)

คณบดีคณะกรรมการบัญชีและการจัดการ

มหาวิทยาลัยมหาสารคาม

สำนักบริหารหลักสูตรระดับบัณฑิตศึกษาและวิจัย

คณะกรรมการบัญชีและการจัดการ มหาวิทยาลัยมหาสารคาม

โทรศัพท์ (043) 754333 ต่อ 3408



## แบบสอบถามเพื่อการวิจัย

### เรื่อง กลยุทธ์ระบบการวัดผลการดำเนินงานแบบบูรณาการและความสำเร็จขององค์กร: การตรวจสอบเชิงประจักษ์บริษัทจดทะเบียนในตลาดหลักทรัพย์แห่งประเทศไทย

#### คำชี้แจง

การวิจัยนี้มีวัตถุประสงค์เพื่อศึกษาเรื่อง “กลยุทธ์ระบบการวัดผลการดำเนินงานแบบบูรณาการและความสำเร็จขององค์กร: การตรวจสอบเชิงประจักษ์บริษัทจดทะเบียนในตลาดหลักทรัพย์แห่งประเทศไทย” ซึ่งข้อมูลที่ได้รับจากท่านมีความสำคัญอย่างยิ่งต่อการวิเคราะห์ข้อมูลในการวิจัย อีกทั้งยังมีประโยชน์ในเชิงวิชาการเป็นอย่างสูง ดังนั้นเพื่อให้การวิจัยนี้มีความเที่ยงตรงและเกิดประโยชน์อย่างแท้จริง จึงขอความกรุณาจากท่านโปรดตอบคำถามครบทุกข้อและทุกตอนตามความเป็นจริงและกรุณาพับใส่ซองจดหมายติดแสตมป์ที่แนบมานี้ ส่งคืนตามที่อยู่ระบุไว้ของผู้วิจัย โดยรายละเอียดของแบบสอบถามประกอบด้วยส่วนคำถาม 7 ตอน ดังนี้

ตอนที่ 1 ข้อมูลทั่วไปของผู้บริหารฝ่ายบัญชีบริษัทจดทะเบียนในตลาดหลักทรัพย์แห่งประเทศไทย

ตอนที่ 2 ข้อมูลทั่วไปของบริษัทจดทะเบียนในตลาดหลักทรัพย์แห่งประเทศไทยในปัจจุบัน

ตอนที่ 3 ความคิดเห็นเกี่ยวกับกลยุทธ์ระบบการวัดผลการดำเนินงานแบบบูรณาการของบริษัทจดทะเบียนในตลาดหลักทรัพย์แห่งประเทศไทย

ตอนที่ 4 ความคิดเห็นเกี่ยวกับผลการดำเนินงานของบริษัทจดทะเบียนในตลาดหลักทรัพย์แห่งประเทศไทย

ตอนที่ 5 ความคิดเห็นเกี่ยวกับปัจจัยภายในที่ส่งผลต่อกลยุทธ์ระบบการวัดผลการดำเนินงานแบบบูรณาการของบริษัทจดทะเบียนในตลาดหลักทรัพย์แห่งประเทศไทย

ตอนที่ 6 ความคิดเห็นเกี่ยวกับปัจจัยภายนอกที่ส่งผลต่อกลยุทธ์ระบบการวัดผลการดำเนินงานแบบบูรณาการของบริษัทจดทะเบียนในตลาดหลักทรัพย์แห่งประเทศไทย

ตอนที่ 7 ข้อคิดเห็นและข้อเสนอแนะ

คำตอบของท่านจะถูกเก็บรักษาเป็นความลับและจะไม่มีการใช้ข้อมูลใดๆ ที่เปิดเผยเกี่ยวกับตัวท่านในการรายงานข้อมูล รวมทั้งจะไม่มีการร่วมใช้ข้อมูลดังกล่าวกับบุคคลภายนอกอื่นใดโดยไม่ได้รับอนุญาตจากท่าน

อนึ่งหากท่านมีข้อสงสัยประการใดเกี่ยวกับแบบสอบถามโปรดติดต่อผู้วิจัย นางพรรณราย ละตา นิสิตปริญญาเอก สาขาการบัญชี มหาวิทยาลัยมหาสารคาม และหากท่านมีความประสงค์ที่จะขอรับรายงานสรุปเกี่ยวกับการศึกษาวิจัยในครั้งนี้ โปรดแจ้งความประสงค์และโปรดระบุ E-mail Address ของท่านตามที่ระบุไว้ด้านล่างหรือแนบนามบัตรของท่านมาพร้อมกับแบบสอบถามชุดนี้

ท่านต้องการรายงานสรุปผลการวิจัยหรือไม่

( ) ต้องการ ระบุ E-mail ..... ( ) ไม่ต้องการ

ข้าพเจ้าขอขอบพระคุณท่านที่ได้สละเวลาในการตอบแบบสอบถามชุดนี้ทุกข้อ ทุกตอน อย่างถูกต้องครบถ้วน และหวังเป็นอย่างยิ่งว่าข้อมูลที่ได้รับจากท่านจะเป็นประโยชน์อย่างยิ่งต่อการศึกษาวิจัยในครั้งนี้ และขอขอบพระคุณท่านเป็นอย่างสูง มา ณ โอกาสนี้

ขอขอบพระคุณที่ให้ข้อมูลไว้ ณ โอกาสนี้



(นางพรรณราย ละตา)  
 นิสิตปริญญาเอก สาขาวิชาการบัญชี  
 คณะการบัญชีและการจัดการ มหาวิทยาลัยมหาสารคาม

ติดต่อโดยตรง โทรศัพท์มือถือ : 084-3905434

E-mail: [Ubumuk.aj.pannarai@hotmail.com](mailto:Ubumuk.aj.pannarai@hotmail.com)

**ตอนที่ 1** ข้อมูลทั่วไปของผู้บริหารฝ่ายบัญชีบริษัทจดทะเบียนในตลาดหลักทรัพย์แห่งประเทศไทย

1. เพศ

ชาย

หญิง

2. อายุ

น้อยกว่า 30 ปี

30 - 40 ปี

41 - 50 ปี

มากกว่า 50 ปี

3. สถานภาพ

โสด

สมรส

หม้าย/หย่าร้าง

4. ระดับการศึกษา

ปริญญาตรีหรือเทียบเท่า

สูงกว่าปริญญาตรี

5. ประสบการณ์การทำงานในธุรกิจ

น้อยกว่า 5 ปี

5 - 10 ปี

11 - 15 ปี

มากกว่า 15 ปี

6. รายได้เฉลี่ยต่อเดือน

ต่ำกว่า 100,000 บาท

100,000 - 125,000 บาท

125,001 - 150,000 บาท

มากกว่า 150,000 บาท



## 7. ตำแหน่งงานในปัจจุบัน

- ผู้อำนวยการฝ่ายบัญชี                       ผู้จัดการฝ่ายบัญชี
- อื่น ๆ โปรดระบุ.....

**ตอนที่ 2 ข้อมูลทั่วไปของบริษัทจดทะเบียนในตลาดหลักทรัพย์แห่งประเทศไทยในปัจจุบัน**

## 1. ประเภทธุรกิจ

- กลุ่มเกษตรและอุตสาหกรรมอาหาร                       กลุ่มสินค้าอุปโภคบริโภค
- กลุ่มธุรกิจการเงิน     กลุ่มสินค้าอุตสาหกรรม
- กลุ่มอสังหาริมทรัพย์และก่อสร้าง                       กลุ่มทรัพยากร
- กลุ่มบริการ     กลุ่มเทคโนโลยี
- อื่น ๆ โปรดระบุ .....

## 2. ระยะเวลาการจดทะเบียนในตลาดหลักทรัพย์แห่งประเทศไทย

- น้อยกว่า 5 ปี     5-10 ปี
- 11-15 ปี     มากกว่า 15 ปี

## 3. ระยะเวลาในการดำเนินธุรกิจ

- น้อยกว่า 5 ปี     5-10 ปี
- 11-15 ปี     มากกว่า 15 ปี

## 4. ทุนจดทะเบียนในปัจจุบันของธุรกิจ

- ต่ำกว่า 1,000,000,000 บาท     1,000,000,000 – 5,000,000,000 บาท
- 5,000,000,001 – 9,000,000,000 บาท                                       มากกว่า 9,000,000,000 บาท



## 5. สินทรัพย์รวมของธุรกิจ

- ต่ำกว่า 10,000,000,000 บาท       10,000,000,000 - 50,000,000,000 บาท  
 50,000,000,001 - 90,000,000,000 บาท       มากกว่า 90,000,000,000 บาท

## 6. จำนวนพนักงานประจำในปัจจุบัน

- น้อยกว่า 50 คน       50 - 100 คน  
 101 - 150 คน       มากกว่า 150 คน

## 7. รายได้ของกิจการเฉลี่ยต่อปี

- ต่ำกว่า 100,000,000 บาท       100,000,000 บาท-500,000,000 บาท  
 500,000,001 บาท- 900,000,000 บาท       มากกว่า 900,000,000 บาท

ตอนที่ 3 ความคิดเห็นเกี่ยวกับกลยุทธ์ระบบการวัดผลการดำเนินงานแบบบูรณาการของบริษัท  
จดทะเบียนในตลาดหลักทรัพย์แห่งประเทศไทย

กลยุทธ์ระบบการวัดผลการดำเนินงานแบบบูรณาการ (Integrated Performance Measurement System Strategy)	ระดับความคิดเห็น				
	มากที่สุด 5	มาก 4	ปานกลาง 3	น้อย 2	น้อยที่สุด 1
การมุ่งเน้นการประเมินผลตามมูลค่าตลาด (Market Value-Based Appraisal Orientation)					
1. กิจการเชื่อมั่นว่าการมีการวัดผลการดำเนินงานตามมูลค่าตลาดจะช่วยทำให้การบริหารงานมีประสิทธิภาพมากขึ้น	5	4	3	2	1
2. กิจการให้ความสำคัญกับการประยุกต์ใช้หลักเกณฑ์ทางการตลาดที่มีความหลากหลายมาเป็นตัววัดผลการดำเนินงาน ซึ่งจะช่วยทำให้การดำเนินงานบรรลุเป้าหมายได้เป็นอย่างดี	5	4	3	2	1



3. กิจกรรมมุ่งเน้นให้มีการวิเคราะห์ถึงข้อดีข้อเสียของหลักเกณฑ์ทางการตลาดแต่ละชนิดที่ใช้ในการวัดผลการดำเนินงาน จะช่วยทำให้สามารถบรรลุวัตถุประสงค์การดำเนินงานได้เป็นอย่างดี	5	4	3	2	1
4. กิจกรรมมุ่งเน้นในการบูรณาการประเด็นต่าง ๆ ที่เกี่ยวข้องทางการตลาดนำมาใช้ในการวัดผลการดำเนินงาน จะช่วยทำให้เกิดศักยภาพในการแข่งขันทางการตลาดมากยิ่งขึ้น	5	4	3	2	1
<b>ความสามารถในการวัดผลที่มุ่งเน้นทางการบัญชี (Accounting-Oriented Measurement Capability)</b>					
5. กิจกรรมเชื่อมั่นว่าการนำข้อมูลทางบัญชีมาใช้เป็นแนวทางวัดผล การดำเนินงาน จะช่วยให้ผลการดำเนินงานสะท้อนความเป็นจริงมากยิ่งขึ้น	5	4	3	2	1
6. กิจกรรมให้ความสำคัญกับการบูรณาการข้อมูลทางการบัญชี ต้นทุนและการเงินเข้าด้วยกันอย่างเป็นระบบและรูปธรรม จะช่วยให้การวัดผลการดำเนินงานมีความครอบคลุมมากยิ่งขึ้น	5	4	3	2	1
7. กิจกรรมมุ่งเน้นให้มีการวิเคราะห์ถึงข้อดี ข้อเสียของข้อมูลทางการบัญชีที่ใช้ในการวัดผลการดำเนินงานอย่างต่อเนื่อง ซึ่งจะช่วยทำให้การบริหารงานมีประสิทธิภาพมากยิ่งขึ้น	5	4	3	2	1

### ตอนที่ 3 (ต่อ)

กลยุทธ์ระบบการวัดผลการดำเนินงานแบบบูรณาการ (Integrated Performance Measurement System Strategy)	ระดับความคิดเห็น				
	มากที่สุด 5	มาก 4	ปานกลาง 3	น้อย 2	น้อยที่สุด 1
<b>ความสามารถในการวัดผลที่มุ่งเน้นทางการบัญชี (ต่อ) (Accounting-Oriented Measurement Capability)</b>					
8. กิจกรรมตระหนักเสมอว่าข้อมูลทางการบัญชีที่ใช้ในการวัดผลการดำเนินงานที่ดี จะต้องสะท้อนให้เห็นถึงสถานการณ์การดำเนินงานของกิจการได้เป็นอย่างดี	5	4	3	2	1



<b>การมุ่งเน้นการประเมินผลตามตัวบ่งชี้</b> <b>(Indicator-Based Assessment Focus)</b> 9. กิจการเชื่อมั่นว่าการมีตัวบ่งชี้ในการวัดความสำเร็จของการดำเนินงานที่มีความหลากหลาย จะช่วยให้กิจการเกิดประสิทธิภาพและประสิทธิผลทั้งในปัจจุบันและอนาคตได้ดียิ่งขึ้น	5	4	3	2	1
10. กิจการให้ความสำคัญกับการศึกษาวิจัยเพื่อค้นหาตัวบ่งชี้วัดผลการดำเนินงานที่มีคุณภาพอย่างต่อเนื่อง ซึ่งจะช่วยเพิ่มความสามารถในการแข่งขันขององค์กรมากยิ่งขึ้น	5	4	3	2	1
11. กิจการตระหนักเสมอว่าตัวบ่งชี้ที่วัดความสำเร็จในการดำเนินงานขององค์กรที่มีความหลากหลาย จะเป็นประโยชน์ต่อการพัฒนากิจการได้เป็นอย่างดีในระยะยาว	5	4	3	2	1
12. กิจการส่งเสริมให้มีการพัฒนาและสร้างสรรค์ตัวบ่งชี้ในการวัดผล การดำเนินงาน ทั้งที่เป็นตัวเงินและไม่เป็นตัวเงิน ทั้งเชิงคุณภาพและ เชิงปริมาณ จะช่วยให้การวัดผลการดำเนินงานครอบคลุมมากยิ่งขึ้น	5	4	3	2	1
<b>การมุ่งเน้นการประเมินผลตามมูลค่าเพิ่ม</b> <b>(Value-Added Evaluation Emphasis)</b> 13. กิจการเชื่อมั่นว่าการประเมินผลการดำเนินงานโดยมุ่งเน้นการสร้างมูลค่าเพิ่มให้กับกิจการ จะช่วยให้การดำเนินงานบรรลุเป้าหมายได้เป็นอย่างดี	5	4	3	2	1
14. กิจการมุ่งเน้นให้มีการสร้างสรรค์กิจกรรมที่ช่วยให้เกิดการพัฒนาศักยภาพทั้งในปัจจุบันและอนาคต ซึ่งจะช่วยให้อาจบรรลุเป้าหมายได้อย่างมีประสิทธิภาพ	5	4	3	2	1

ตอนที่ 3 (ต่อ)

กลยุทธ์ระบบการวัดผลการดำเนินงานแบบบูรณาการ (Integrated Performance Measurement System Strategy)	ระดับความคิดเห็น				
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
	5	4	3	2	1





<b>การมุ่งเน้นการประเมินผลตามมูลค่าเพิ่ม (ต่อ)</b> <b>(Value-Added Evaluation Emphasis)</b> 15. กิจการส่งเสริมให้นำผลการฝึกอบรมและพัฒนาบุคลากรมาเป็นแนวทางในการวัดผลการดำเนินงาน จะช่วยให้ประสบความสำเร็จในการดำเนินงานได้ดียิ่งขึ้น	5	4	3	2	1
16. กิจการมุ่งมั่นในการนำนวัตกรรมใหม่ ๆ ที่เกิดขึ้นในองค์กรมาเป็นเกณฑ์ในการวัดผลการดำเนินงาน ซึ่งจะช่วยให้เกิดศักยภาพในการแข่งขันมากยิ่งขึ้น	5	4	3	2	1
<b>การใช้เกณฑ์การวัดผลที่มุ่งเน้นรายได้</b> <b>(Revenue-Oriented Criterion Implementation)</b> 17. กิจการเชื่อมั่นว่าการนำรายได้และยอดขายมาเป็นเกณฑ์ในการวัด ผลการดำเนินงาน จะช่วยให้สามารถเพิ่มศักยภาพในการบริหารงานมากยิ่งขึ้น	5	4	3	2	1
18. กิจการให้ความสำคัญกับการนำเสนอข้อมูลที่เกี่ยวข้องกับรายได้และยอดขายในกิจกรรมต่างๆ อย่างเป็นระบบและรูปธรรม ซึ่งจะช่วยให้การบริหารงานประสบความสำเร็จได้เป็นอย่างดี	5	4	3	2	1
19. กิจการมุ่งเน้นให้มีการพัฒนาระบบที่มีศักยภาพในการรับรู้และตรวจสอบรายได้อย่างเป็นรูปธรรม ซึ่งจะช่วยให้การวัดผลการดำเนินงาน เกิดประสิทธิภาพสูงสุด	5	4	3	2	1
20. กิจการส่งเสริมให้แต่ละหน่วยงานเพิ่มศักยภาพในการหารายได้อย่างต่อเนื่อง ซึ่งจะช่วยให้การดำเนินงานประสบความสำเร็จมากยิ่งขึ้น	5	4	3	2	1

#### ตอนที่ 4 ความคิดเห็นเกี่ยวกับผลการปฏิบัติงานของบริษัทจดทะเบียนในตลาดหลักทรัพย์ฯ



ผลการปฏิบัติงาน	ระดับความคิดเห็น				
	มากที่สุด 5	มาก 4	ปานกลาง 3	น้อย 2	น้อยที่สุด 1
<b>ความผูกพันต่อองค์กรอย่างยั่งยืน</b> (Sustainable Organizational Commitment)					
1. บุคลากรมีความยินดีและพร้อมที่จะทำทุกอย่างเพื่อตอบสนององค์กรอย่างชัดเจน	5	4	3	2	1
2. บุคลากรมีความรู้สึกภาคภูมิใจที่ได้เป็นส่วนหนึ่งขององค์กรพร้อมที่จะเสียสละและอุทิศตนในการปฏิบัติงานให้กับองค์กรอย่างสุดความสามารถ	5	4	3	2	1
3. บุคลากรมีความรักและมุ่งมั่นที่จะปฏิบัติงานในองค์กรต่อไปในอนาคต	5	4	3	2	1
4. บุคลากรมีความมั่นใจในศักยภาพและความสามารถในการบริหารจัดการขององค์กร	5	4	3	2	1
5. บุคลากรรับรู้ว่ามีปัญหาต่าง ๆ ที่เกิดขึ้นในองค์กรเปรียบเสมือนปัญหา ของตน พร้อมทั้งช่วยเหลือและให้ความร่วมมือด้วยความเต็มใจ	5	4	3	2	1
<b>พฤติกรรมความเป็นสมาชิกที่ดีขององค์กร</b> (Organizational Citizenship Behavior)					
6. บุคลากรให้ความช่วยเหลืออย่างเต็มใจทุกครั้งที่เห็นว่ องค์กรหรือเพื่อนร่วมงานต้องการความช่วยเหลือเรื่องต่าง ๆ โดยคำนึงถึงประโยชน์ส่วนร่วมมากกว่าประโยชน์ส่วนตน	5	4	3	2	1
7. บุคลากรมีทัศนคติเชิงบวกและมีความเต็มใจในการอดทนต่อ ปัญหา ความยากลำบาก ความเครียดและความกดดันต่าง ๆ ที่เกิดขึ้นจากผู้ร่วมงานหรือจากการปฏิบัติงาน	5	4	3	2	1
8. บุคลากรมีความซื่อสัตย์ในการปฏิบัติงาน ตรงต่อเวลา ดูแล รักษาทรัพย์สินขององค์กรเสมือนหนึ่งเป็นทรัพย์สินของตน บริหารเวลาทำงานอย่างมีคุณค่าไม่ใช้เวลาปฏิบัติงานไปกับกิจ รุระส่วนตัว	5	4	3	2	1



9. บุคลากรมีการคิดค้นวิธีการใหม่ ๆ ในการปฏิบัติงานเพื่อพัฒนาผลการปฏิบัติงานของตน และให้ข้อเสนอแนะวิธีการใหม่ ๆ แก่กิจการเพื่อเสริมสร้างความสามารถในการแข่งขันในระยะยาว	5	4	3	2	1
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**ตอนที่ 4 (ต่อ)**

ผลการปฏิบัติงาน	ระดับความคิดเห็น				
	มากที่สุด 5	มาก 4	ปานกลาง 3	น้อย 2	น้อยที่สุด 1
<b>พฤติกรรมความเป็นสมาชิกที่ดีขององค์กร (ต่อ)</b> (Organizational Citizenship Behavior) 10. บุคลากรยึดมั่นในการปฏิบัติตามกฎ ระเบียบและข้อบังคับที่สอดคล้องกับความต้องการทางสังคมและสาธารณชนอย่างต่อเนื่อง	5	4	3	2	1
<b>ความจงรักภักดีต่อองค์กรอย่างต่อเนื่อง</b> (Continuous Organizational Loyalty) 11. บุคลากรแสดงออกถึงการสนับสนุนและสื่อสารข้อมูลที่เกี่ยวข้องกับองค์กรต่อบุคคลภายนอกในเชิงบวกเสมอ	5	4	3	2	1
12. บุคลากรตระหนักถึงการสร้างความรักและความศรัทธาต่อองค์กร ผู้บริหารและงานที่รับผิดชอบอย่างสม่ำเสมอ	5	4	3	2	1
13. บุคลากรมีความจงรักภักดีต่อองค์กรอย่างต่อเนื่อง ซึ่งเนื่องมาจากการสร้างความสัมพันธ์ที่ดีระหว่างองค์กรกับพนักงาน	5	4	3	2	1
14. บุคลากรมีความซื่อสัตย์ในการปฏิบัติงาน โดยไม่แสดงพฤติกรรม ที่ก่อให้เกิดการทุจริตหรือฉ้อโกงในสินทรัพย์และผลประโยชน์อื่นขององค์กร ไม่ทำให้เกิดความเสียหายต่อองค์กรทั้งในปัจจุบันและอนาคต	5	4	3	2	1
15. บุคลากรยึดมั่นและปรารถนาอย่างแรงกล้าในการปฏิบัติงานเพื่อให้บรรลุเป้าหมายขององค์กรอย่างต่อเนื่อง	5	4	3	2	1



<b>ความสามารถในการแข่งขันขององค์กร</b> (Organizational Competitiveness)					
16. กิจการมีการบริหารทรัพยากรที่มีอยู่ให้เกิดประสิทธิภาพสูงสุด	5	4	3	2	1
17. กิจการมีการนำเสนอวิธีการและนวัตกรรมใหม่ ๆ ที่มีศักยภาพมาใช้ในบริหารจัดการองค์กรให้มีประสิทธิภาพที่โดดเด่นจากคู่แข่ง	5	4	3	2	1

ตอนที่ 4 (ต่อ)

ผลการปฏิบัติงาน	ระดับความคิดเห็น				
	มากที่สุด 5	มาก 4	ปานกลาง 3	น้อย 2	น้อยที่สุด 1
<b>ความสามารถในการแข่งขันขององค์กร (ต่อ)</b> (Organizational Competitiveness)					
18. กิจการมีส่วนแบ่งทางการตลาด การเติบโตของยอดขาย และกำไรที่สูงกว่าคู่แข่งในอุตสาหกรรมเดียวกัน	5	4	3	2	1
19. กิจการสามารถสร้างความโดดเด่นในคุณภาพของสินค้าและบริการ และได้รับการยอมรับจากลูกค้าอย่างต่อเนื่อง	5	4	3	2	1
20. กิจการมีผลการดำเนินงานในภาพรวมอยู่ในเกณฑ์ดีและเหนือกว่าคู่แข่งหลัก ตลอดจนกิจการได้รับการยอมรับว่ากิจการผลิตและจำหน่ายสินค้าและบริการได้เหนือกว่าคู่แข่ง	5	4	3	2	1
<b>ความสำเร็จของกิจการ (Firm Success)</b>					
21. กิจการสามารถบรรลุเป้าหมายทั้งด้านคุณภาพ ประสิทธิภาพและประสิทธิผลในการดำเนินงานได้เป็นอย่างดี	5	4	3	2	1
22. กิจการสามารถรักษาการเติบโตของธุรกิจและอยู่รอดได้ในอนาคตอย่างต่อเนื่อง แม้จะมีอุปสรรคหรือวิกฤตการณ์ใด ๆ	5	4	3	2	1



23. กิจการได้รับการยอมรับและเป็นที่รู้จักของลูกค้าและ แวดวงการค้าเงินธุรกิจ ถึงความสามารถในการดำเนิน กิจการที่มีประสิทธิภาพและบรรลุผลสำเร็จตามเป้าหมายที่ วางไว้	5	4	3	2	1
24. กิจการสามารถเพิ่มศักยภาพและความสามารถของ บุคลากรอย่างเป็นรูปธรรมและต่อเนื่อง	5	4	3	2	1
25. กิจการมีผลการดำเนินงานทั้งด้านที่เป็นตัวเงินและไม่ เป็นตัวเงินเป็นไปตามแผนงานที่วางไว้ สอดคล้องกับ วิสัยทัศน์และเป้าหมายภารกิจของกิจการ	5	4	3	2	1

ตอนที่ 5 ความคิดเห็นเกี่ยวกับปัจจัยภายในที่ส่งผลต่อกลยุทธ์ระบบการวัดผลการดำเนินงานแบบ  
บูรณาการของบริษัทจดทะเบียนในตลาดหลักทรัพย์แห่งประเทศไทย

ปัจจัยภายในที่ส่งผลต่อกลยุทธ์ระบบการวัดผลการดำเนินงาน แบบบูรณาการ	ระดับความคิดเห็น				
	มาก ที่สุด	มาก	ปาน กลาง	น้อย	น้อย ที่สุด
	5	4	3	2	1
<b>การสนับสนุนจากผู้บริหารระดับสูง (Top management support)</b>					
1. ผู้บริหารระดับสูงเชื่อมั่นว่าการใช้เทคนิคและวิธีการบริหาร ใหม่ ๆ จะทำให้การบริหารงานประสบความสำเร็จมากยิ่งขึ้น	5	4	3	2	1
2. ผู้บริหารระดับสูงสนับสนุนให้มีการลงทุนด้านทรัพยากร ต่าง ๆ ทั้งที่เป็นตัวเงินและไม่เป็นตัวเงินอย่างเต็มที่ ทำให้การ บริหารงานในปัจจุบันบรรลุเป้าหมายได้ดียิ่งขึ้น	5	4	3	2	1
3. ผู้บริหารระดับสูงให้ความสำคัญกับการปรับปรุง พัฒนา และเปลี่ยนแปลงระบบการทำงานที่เป็นอยู่ให้สอดคล้องกับ สถานการณ์ในอนาคตอยู่เสมอส่งผลให้บรรลุเป้าหมายได้ดี ยิ่งขึ้น	5	4	3	2	1



4. ผู้บริหารระดับสูงสนับสนุนให้บุคลากรเข้ามามีส่วนร่วมในการทำงานและการแก้ไขปัญหาต่าง ๆ ขององค์กรอย่างเต็มที่ ช่วยเพิ่มประสิทธิภาพและประสิทธิผลสูงสุดในดำเนินงาน	5	4	3	2	1
<b>พลวัตการเรียนรู้ขององค์กร</b> (Organizational Learning Dynamism)					
5. กิจการเชื่อมั่นว่าการเรียนรู้ขององค์กรอย่างต่อเนื่อง จะช่วยทำให้เกิดศักยภาพและสามารถอยู่รอดในการแข่งขันได้อย่างต่อเนื่อง	5	4	3	2	1
6. กิจการให้ความสำคัญกับการศึกษาและทำความเข้าใจสภาพแวดล้อมต่าง ๆ ภายนอกอย่างต่อเนื่อง ส่งผลให้สามารถพัฒนาองค์กรได้อย่างสม่ำเสมอ	5	4	3	2	1
7. กิจการสนับสนุนให้มีการผสมผสานเทคนิค วิธีการหรือเทคโนโลยีใหม่ๆ ในการดำเนินงานอย่างต่อเนื่อง ช่วยสามารถทำให้เพิ่มศักยภาพในการแข่งขันได้เป็นอย่างดี	5	4	3	2	1
8. กิจการส่งเสริมให้บุคลากรเข้าร่วมฝึกอบรมและพัฒนาความรู้ใหม่ ๆอย่างต่อเนื่อง จะช่วยทำให้เกิดความสำเร็จในการดำเนินงานมากยิ่งขึ้น	5	4	3	2	1

## ตอนที่ 5 (ต่อ)

ปัจจัยภายในที่ส่งผลต่อกลยุทธ์ระบบการวัดผลการดำเนินงานแบบบูรณาการ	ระดับความคิดเห็น				
	มากที่สุด 5	มาก 4	ปานกลาง 3	น้อย 2	น้อยที่สุด 1
<b>พลวัตการเรียนรู้ขององค์กร (ต่อ)</b> (Organizational Learning Dynamism)					
9. กิจการผลักดันให้มีการแลกเปลี่ยนเรียนรู้ระหว่างบุคคลกร อยู่เสมอจะช่วยให้เกิดประสิทธิภาพและประสิทธิผลสูงสุด	5	4	3	2	1
<b>ระบบบัญชีบริหารที่ดี</b> (Best Management Accounting System)					
10. กิจการเชื่อมั่นว่าการมีระบบบัญชีบริหารที่ดี จะช่วยให้นำเสนอข้อมูลเพื่อการตัดสินใจมีประสิทธิภาพมากยิ่งขึ้น	5	4	3	2	1



11. กิจกรรมมุ่งเน้นให้มีการพัฒนาระบบบัญชีบริหารอย่างเป็นรูปธรรม ซึ่งจะช่วยให้นำข้อมูลทางการบัญชีไปใช้ประโยชน์ได้มากยิ่งขึ้น	5	4	3	2	1
12. กิจกรรมให้ความสำคัญกับการประยุกต์ใช้เทคโนโลยีทางด้านการบัญชีบริหารมากยิ่งขึ้นจะช่วยให้สามารถนำเสนอข้อมูลได้ทันสมัยและสอดคล้องกับสถานการณ์มากยิ่งขึ้น	5	4	3	2	1
13. กิจกรรมตระหนักเสมอว่าระบบบัญชีบริหารที่ดี จะต้องตอบสนองและช่วยให้ผู้บริหารสามารถวางแผนการดำเนินงานทั้งในปัจจุบันและอนาคตได้ดียิ่งขึ้น	5	4	3	2	1
<b>สมรรถนะทางการบัญชี (Accounting Competency)</b>					
14. กิจกรรมเชื่อมั่นว่าการมีศักยภาพและความสามารถทางการบัญชี เป็นอย่างดี จะช่วยทำให้การบริหารงานบรรลุเป้าหมายได้ดียิ่งขึ้น	5	4	3	2	1
15. กิจกรรมมุ่งเน้นให้มีการพัฒนาความรู้ความสามารถของนักบัญชีอย่างต่อเนื่อง ซึ่งจะช่วยทำให้เกิดศักยภาพในการทำงานมากยิ่งขึ้น	5	4	3	2	1
16. กิจกรรมให้ความสำคัญกับการพัฒนาระบบและเทคโนโลยีต่าง ๆ ที่เกี่ยวข้องกับการบัญชีอย่างเป็นรูปธรรม จะช่วยทำให้การปฏิบัติงานทาง การบัญชีเกิดประสิทธิภาพสูงสุด	5	4	3	2	1
17. กิจกรรมตระหนักเสมอว่าศักยภาพและความสามารถทางการบัญชีขององค์กร จะช่วยสนับสนุนให้การดำเนินงานบรรลุเป้าหมายทั้งในปัจจุบันและอนาคต	5	4	3	2	1

ตอนที่ 6 ความคิดเห็นเกี่ยวกับปัจจัยภายนอกที่ส่งผลต่อกลยุทธ์ระบบการวัดผลการดำเนินงานแบบบูรณาการของบริษัทจดทะเบียนในตลาดหลักทรัพย์แห่งประเทศไทย

ปัจจัยภายนอกที่ส่งผลต่อกลยุทธ์ระบบการวัดผลการดำเนินงานแบบบูรณาการ	ระดับความคิดเห็น				
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
	5	4	3	2	1
ความสมบูรณ์แบบของเทคโนโลยีสารสนเทศ (Information Technology Complementarity)					



1. ในปัจจุบันเทคโนโลยีสารสนเทศมีการเจริญเติบโตมากยิ่งขึ้นทำให้กิจการต่าง ๆ มีการปรับปรุงพัฒนาการประยุกต์ใช้เทคโนโลยีดังกล่าวได้อย่างมีประสิทธิภาพมากยิ่งขึ้น	5	4	3	2	1
2. เทคโนโลยีสารสนเทศมีความหลากหลายและราคาถูกลงทำให้กิจการต่าง ๆ มีการเลือกใช้เทคโนโลยีสารสนเทศที่มีความเหมาะสมกับกลยุทธ์ในการดำเนินงานของกิจการ	5	4	3	2	1
3. การพัฒนาระบบเทคโนโลยีสารสนเทศเกิดขึ้นอย่างต่อเนื่องทำให้กิจการต่าง ๆ ต้องมุ่งเน้นในการปรับปรุงและพัฒนากิจการให้มีประสิทธิภาพมากยิ่งขึ้น	5	4	3	2	1
4. เทคโนโลยีสารสนเทศในปัจจุบันมีความทันสมัยมากยิ่งขึ้นทำให้กิจการต่าง ๆ สามารถดำเนินงานได้อย่างสะดวกรวดเร็วมากขึ้นและลดความผิดพลาดในการดำเนินงานได้เป็นอย่างดี	5	4	3	2	1
<b>ความรุนแรงของสภาพแวดล้อมในการแข่งขัน (Competitive Environment intensity)</b>					
5. ในปัจจุบันสภาพแวดล้อมทางธุรกิจมีความผันผวนมากขึ้นทำให้กิจการต่าง ๆ ต้องติดตามการเปลี่ยนแปลงสภาพแวดล้อมดังกล่าว มากยิ่งขึ้น	5	4	3	2	1
6. ปัจจัยทางตลาดที่เกี่ยวข้องกับการดำเนินธุรกิจมีความหลากหลายมากยิ่งขึ้น ทำให้กิจการต่าง ๆ มุ่งเน้นในการสร้างศักยภาพและความสามารถในการแข่งขันอย่างต่อเนื่อง	5	4	3	2	1
7. การแข่งขันในปัจจุบันมีความรุนแรงอย่างมากทั้งจากคู่แข่งภายในประเทศและต่างประเทศ ทำให้กิจการต่าง ๆ มุ่งเน้นในการสร้างสรรค์และพัฒนาศักยภาพการบริหารงานอย่างต่อเนื่อง	5	4	3	2	1
8. ลูกค้ามีความต้องการที่หลากหลายมากยิ่งขึ้น ทำให้กิจการต่าง ๆ ต้องมุ่งเน้นในการตอบสนองต่อความต้องการให้มีประสิทธิภาพมากยิ่งขึ้น	5	4	3	2	1

ตอนที่ 7 ข้อคิดเห็นและข้อเสนอแนะเกี่ยวกับกลยุทธ์ระบบการวัดผลการดำเนินงานแบบบูรณาการ และประเด็นต่าง ๆ ที่เกี่ยวข้อง

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ขอขอบพระคุณท่านที่ได้สละเวลาในการตอบแบบสอบถามชุดนี้ทุกข้อ ทุกตอน และขอความกรุณาท่านโปรดพับแบบสอบถามแล้วใส่ซองที่แนบมาพร้อมนี้ เพื่อส่งคืนผู้วิจัยตามที่อยู่ที่ระบุไว้



**APPENDIX H**  
**Cover Letters and Questionnaire: English Version**





### **Questionnaire for the Ph.D. Dissertation Research entitled**

**“Integrated Performance Measurement System Strategy and Firm Success: An Empirical Investigation of Thai-Listed Firms”**

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#### **Directions**

This research is a part of the doctoral dissertation of Mrs. Pannarai Lata at the Maharakham Business School, Maharakham University, Thailand. The objective of this research is to investigate the relationships between integrated performance measurement system strategy and firm success of Thai-Listed Firms.

Your answer will be kept as confidentiality, and your information will not be shared with any outside party without your permission. If you have any questions with respect to this research, please contact me directly.

If you want a summary of this research, please indicate your E-mail address or attach your business card with this questionnaire. The summary will be sent to you as soon as the analysis is completed.

Do you want a summary of the results?

( ) Yes e-mail \_\_\_\_\_ ( ) No -

Thank you for your time answering all questions. I very much hope that your answer will provide the valuable information for my dissertation.

Sincerely yours,

(Mrs. Pannarai Lata)

Ph.D. Student

Maharakham Business School

Maharakham University, Thailand



Contact Info:

Mobile phone: 084-390-5434

E-mail: Ubumuk.aj.pannarai@gmail.com

**Part 1** Demographic data of an accounting executive of Thai-Listed firms

1. Gender

Male

Female

2. Age

Less than 30 years old

30 – 40 years old

41 – 50 years old

More than 50 years old

3. Marital status

Single

Married

Divorced

4. Educational level

Bachelor's degree or lower

Higher than bachelor's degree

5. Working experiences

Less than 5 years

5-10 years

11-15 years

More than 15 years

6. Average income per month at present

Less than 100,000 baht

100,000-125,000 baht

125,001-150,000 baht

More than 150,000 baht

7. Working position at present

Accounting director

Accounting manager

Other (Please specify).....



**Part 2** General data about Thai-Listed firms

1. Type of business

- |  |  |
|--|--|
| <input type="checkbox"/> Agro and Food Industry      | <input type="checkbox"/> Consumer Products |
| <input type="checkbox"/> Financials                  | <input type="checkbox"/> Industrials       |
| <input type="checkbox"/> Property and Construction   | <input type="checkbox"/> Resources         |
| <input type="checkbox"/> Services                    | <input type="checkbox"/> Technology        |
| <input type="checkbox"/> Other (Please specify)..... |  |

2. The period of time registered in The Stock Exchange of Thailand

- |  |   |
|--|---|
| <input type="checkbox"/> Less than 5 years | <input type="checkbox"/> 5 – 10 years       |
| <input type="checkbox"/> 11 – 15 years     | <input type="checkbox"/> More than 15 years |

3. The period of time in operating business

- |  |   |
|--|---|
| <input type="checkbox"/> Less than 5 years | <input type="checkbox"/> 5 – 10 years       |
| <input type="checkbox"/> 11 – 15 years     | <input type="checkbox"/> More than 15 years |

4. Authorized capitals

- Less than 1,000,000,000 baht
- 1,000,000,000 – 5,000,000,000 baht
- 5,000,000,001 – 10,000,000,000 baht
- More than 10,000,000,000 baht

5. The total assets of the firm

- Less than 10,000,000,000 baht
- 10,000,000,000 – 50,000,000,000 baht
- 50,000,000,001 – 100,000,000,000 baht
- More than 100,000,000,000 baht

6. Number of employees

- |                                       |  |
|---------------------------------------|--|
| <input type="checkbox"/> Less than 50 | <input type="checkbox"/> 50 – 100      |
| <input type="checkbox"/> 101 – 150    | <input type="checkbox"/> More than 150 |

7. Average revenues per year (baht)

- Less than 100,000,000 baht



- 100,000,000 – 500,000,000 baht
- 500,000,001 – 900,000,000 baht
- More than 900,000,000 baht

**Section 3 Opinions in Integrated Performance Measurement System Strategy of Thai-Listed firms**

Integrated Performance Measurement System Strategy	Opinion Levels				
	Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1
<b><u>Market Value-Based Appraisal</u></b>					
<b><u>Orientation:</u></b>					
1. Firm believes that the assessment of the performance based on market value to increase the administrative efficiency.	5	4	3	2	1
2. Firm gives special importance to the application of a variety of marketing criteria to measure performance to help make the operation of the firm can achieve its goals well.	5	4	3	2	1
3. Firm emphasizes the analysis of the pros and cons of each type of market criteria to utilize to measure performance that lead to achieving the firm's operational objectives well.	5	4	3	2	1
4. Firm strives to integrate various issues of related marketing to apply to measure performance that lead to the higher organizational competitiveness.	5	4	3	2	1
<b><u>Accounting-Oriented Measurement</u></b>					
<b><u>Capability:</u></b>					
5. Firm believes that the adoption of the accounting data to use as the guide to	5	4	3	2	1



performance measurement to help operational outcomes to reflect the clearer real picture of overall performance.					
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**Section 3** (continued)

Integrated Performance Measurement System Strategy	Opinion Levels				
	Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1
<b><u>Accounting-Oriented Measurement Capability:</u></b>					
6. Firm gives importance to integrate accounting, cost, and financial data together systematically and fairly lead to the more comprehensive performance measurement.	5	4	3	2	1
7. Firm emphasizes providing to have the analysis of the advantages and disadvantages of the use of accounting information in performance measurement continuously to increase the business management efficiently.	5	4	3	2	1
8. Firm realizes that the accounting information which is applied to measure well when it can reflect the situation of whole business operations.	5	4	3	2	1
<b><u>Indicator-Based Assessment Focus:</u></b>					
9. Firm believes that the variety of indicators to measure the success of the implementation to help a firm has better	5	4	3	2	1



efficiency and more effectiveness both in present and future.					
10. Firm focuses on research to find performance measurement indicators which have quality continued to increase more organizational competitiveness.	5	4	3	2	1

**Section 3 (continued)**

Integrated Performance Measurement System Strategy	Opinion Levels				
	Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1
<b><u>Indicator-Based Assessment Focus:</u></b> 11. Firm always recognizes that a variety of indicators which are used for measuring the success of organizational implementation to be beneficial to the good business development in a long-term.	5	4	3	2	1
12. Firm encourages the development and creation of both financial and non-financial indicators and qualitative and quantitative indicators to measure performance to expand overall performance measurement is more comprehensive.	5	4	3	2	1
<b><u>Value-Added Evaluation Emphasis:</u></b> 13. Firm believes that the evaluation of performance which focus on Value-Added to aid business operations can achieve its goal well.	5	4	3	2	1





14. Firm emphasizes to create the activities that contribute to organizational development, both in the present and the future to enable achieving its goal more efficiently.	5	4	3	2	1
15. Firm encourages leading the outcomes of staffs' training and development to use as the guideline for performance measurement within the organization to increase better operational successes.	5	4	3	2	1

**Section 3 (continued)**

Integrated Performance Measurement System Strategy	Opinion Levels				
	Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1
<b><u>Value-Added Evaluation Emphasis:</u></b> 16. Firm is engrossed in bringing innovations which occur in the organization to use as criteria for performance measurement to boost organizational competitiveness even more.	5	4	3	2	1
<b><u>Revenue-Oriented Criterion Implementation:</u></b> 17. Firm believes that revenue and sales data when are brought to use as criteria for performance measurement to help enhance the potential of its administration even more.	5	4	3	2	1
18. Firm focuses on the systematic and the concrete presentation of income and sales information on all activities for supporting the more success of business operations.	5	4	3	2	1



19. Firm emphasizes the development of potential systems to recognize and investigate all revenues justly as a result of the highest effective operation.	5	4	3	2	1
20. Firm encourages each department increasing the potential generation of revenue continually to allow the operation toward success fast.	5	4	3	2	1

#### **Section 4 Opinion in operational outcomes of Thai-Listed firms**

Operational Outcomes	Opinion Levels				
	Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1
<b><u>Sustainable Organizational Commitment:</u></b>					
1. Employees are willing and ready to do everything to requite to the organization clearly.	5	4	3	2	1
2. Employees are proud to be a part of the organization and are willing sacrifice and dedication in working for the organization as best they can do it.	5	4	3	2	1
3. Employees love and commit to working with the organization in the future.	5	4	3	2	1
4. Employees have confidence in the potential and ability of organizational management.	5	4	3	2	1
5. Employees recognize that the problems in the organization to be like as their problem, and they are ready to assist and	5	4	3	2	1



cooperate willingly.					
<b><u>Organizational Citizenship Behavior:</u></b>					
6. Employees are usually willing to help a firm whenever they see that their organization or co-workers to request assistance and they are regardless of the benefits of themselves.	5	4	3	2	1
7. Employees have a positive attitude and willingness to endure to problems, difficulties, stress and pressures which arise from co-workers or works.	5	4	3	2	1

**Section 4 (continued)**

Operational Outcomes	Opinion Levels				
	Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1
<b><u>Organizational Citizenship Behavior:</u></b>					
8. Employees have integrity in their work, on time, maintain the organization's asset is like as of themselves and can manage work time appropriately by do not spend their work times in other matters.	5	4	3	2	1
9. Employees seek new ways of working in order to improve their performance, and they can provide recommendations and offer new ways for the firm to enhance competitiveness in the long term.	5	4	3	2	1
10. Employees adhere to compliance the rules, and regulations that are consistent with the needs of society and public continuously.	5	4	3	2	1



<b><u>Continuous Organizational Loyalty:</u></b> 11. Employees express to support their organization and always positively communicate the firm's information with outsiders.	5	4	3	2	1
12. Employees always have awareness concerning the creation of love and devotion to the organization, executives, and their works.	5	4	3	2	1
13. Employees are loyal to the organization due to creating a better relationship between the organization and employees continually.	5	4	3	2	1

**Section 4 (continued)**

Operational Outcomes	Opinion Levels				
	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
	5	4	3	2	1
<b><u>Continuous Organizational Loyalty:</u></b> 14. Employees have integrity in the performance and do not express behaviors that cause corruption or fraud of the assets and interests of the organization, as well as not to cause damage to an organization in the present and the future.	5	4	3	2	1
15. Employees adhere and desire to work to achieve the goals of the firm continually.	5	4	3	2	1
<b><u>Organizational Competitiveness:</u></b> 16. Firm has the management of its available resources to achieve maximum efficiency.	5	4	3	2	1
17. Firm offers new methods and innovations that have the potential to be used in the whole corporate management contribute to the	5	4	3	2	1



increase of more efficiency and outstanding than other competitors.					
18. Firm's market share, sales growth, and profit margin are higher than its competitors in the same industry.	5	4	3	2	1
19. Firm can create distinctive about the quality of products and service, and is accepted by clients continuously.	5	4	3	2	1
20. Firm's overall operating performance are stronger, better and higher than its competitors, as well as it is still recognized that the production and distribution of goods and services are more than its competitors.	5	4	3	2	1

**Section 4 (continued)**

Operational Outcomes	Opinion Levels				
	Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1
<b><u>Firm Success:</u></b>					
21. Firm can achieve in terms of quality, efficiency and effectiveness of operations well.	5	4	3	2	1
22. Firm can sustain the growth and survive of business in the future continuously despite obstacles or any crisis.	5	4	3	2	1
23. Firm has been accepted and is known for its customers and firms in the same industry about the ability to operate effectively and to achieve the set of goals.	5	4	3	2	1
24. Firm can increase the potential and the ability of personnel to be concrete and continuous.	5	4	3	2	1



25. The firm's overall performance both in monetary and non-monetary are in accord with the plan, vision, mission, and goals of the business.	5	4	3	2	1
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**Section 5** Opinion in internal factors that influence to integrated performance measurement system strategy of Thai-Listed firms

Internal factors that influence to integrated performance measurement system strategy	Opinion Levels				
	Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1
<b>Top Management Support:</b> 1. Top management believes that the use of new techniques and methods will make the administration more successfully.	5	4	3	2	1

**Section 5** (continued)

Internal factors that influence to integrated performance measurement system strategy	Opinion Levels				
	Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1
<b>Top Management Support:</b> 2. Top management encourages the investment of resources both monetary and non-monetary fully contributing to the more achievement of the current administration.	5	4	3	2	1
3. Top management focuses on the improvement, development, and change of available systems to provide consistent with the situation in the future to increase the goal achievement very well.	5	4	3	2	1



4. Top management support employees to participate in the operation and problem-solving of the firm to fully enhance the efficiency and effectiveness of operations.	5	4	3	2	1
<b><u>Organizational Learning Dynamism:</u></b>					
5. Firm strongly believes that continuous learning organization to help build to be potential and can survive in the competition continuously.	5	4	3	2	1
6. Firm emphasizes studies and focuses on understanding a variety of firm's external environments continuously to cause to increase the ability of organizational development evenly.	5	4	3	2	1
7. Firm encourages the combination of techniques, methods or new technologies in the business operation continuously for enhancing competitiveness even better.	5	4	3	2	1

### **Section 5** (continued)

Internal factors that influence to integrated performance measurement system strategy	Opinion Levels				
	Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1
<b><u>Organizational Learning Dynamism:</u></b>					
8. Firm encourages employees to participate in the training and development of new knowledge continuously to contribute to the success of the operation increasingly.	5	4	3	2	1
9. Firm pushes for the exchange of knowledge of employees to help achieve maximum effectiveness and efficiency.	5	4	3	2	1



<b><u>Best Management Accounting System:</u></b>					
10. Firm is confident that the best management accounting system can make the presentation of information for decision-making to be more effective.	5	4	3	2	1
11. Firm focuses on the concrete development of management accounting system is substantial because it enables accounting information can be extremely utilized.	5	4	3	2	1
12. Firm emphasizes on applying the technologies of management accounting to aid the presentation of data in accordance with the situation.	5	4	3	2	1
13. Firm always recognizes that the best accounting management system to respond the needs and enables executives to be able to plan operations, both in the present and in the future very well.	5	4	3	2	1

**Section 5** (continued)

<b>Internal factors that influence to integrated performance measurement system strategy</b>	<b>Opinion Levels</b>				
	<b>Strongly Agree</b> 5	<b>Agree</b> 4	<b>Not Sure</b> 3	<b>Disagree</b> 2	<b>Strongly Disagree</b> 1
<b><u>Accounting Competency:</u></b> 14. Firm believes that the potentiality and capabilities of accounting enable the administration to achieve its goals well.	5	4	3	2	1
15. Firm focuses on the development of knowledge and skills of accountants continuously, thereby causing the potential for even more functionality.	5	4	3	2	1





16. Firm focuses on the concrete development of accounting systems and technologies for helping the higher accounting performance of the firm.	5	4	3	2	1
17. Firm always realizes that the organization's potentiality and capabilities of accounting will support the goal achievement in the present and the future.	5	4	3	2	1

**Section 6** Opinion external factors that influence to integrated performance measurement system strategy of Thai-Listed firms

External factors that influence to integrated performance measurement system strategy	Opinion Levels				
	Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1
<b>Information Technology Complementarity:</b> 1. Currently, information technology is more growth, resulting in firms need to improve and develop itself to be able to apply such technologies more efficiently.	5	4	3	2	1

**Section 6** (continued)

External factors that influence to integrated performance measurement system strategy	Opinion Levels				
	Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1
<b>Information Technology Complementarity:</b> 2. Information technology is diverse and cheaper down so firms can select the use of information technologies that there are appropriate with the operational strategy of each business.	5	4	3	2	1
3. The development of information technology	5	4	3	2	1





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..... Thank you for your participation.....



**APPENDIX I**  
**Letters to the Experts**





## บันทึกข้อความ

หน่วยงาน คณะการบัญชีและการจัดการ มหาวิทยาลัยมหาสารคาม โทรศัพท์ 043-754333 ต่อ 3431

ที่ ศธ.0530.10/

วันที่ 5 มิถุนายน 2559

เรื่อง ขอเรียนเชิญเป็นผู้เชี่ยวชาญตรวจสอบเครื่องมือวิจัย

เรียน รองศาสตราจารย์ ดร.ปพฤกษ์บาร์มี อุตสาหกรรมาณิชกิจ

ด้วย นางพรรณราย ละตา นิสิตระดับปริญญาเอก หลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาการบัญชี (ปร.ด.) คณะการบัญชีและการจัดการ มหาวิทยาลัยมหาสารคาม กำลังศึกษาวิทยานิพนธ์เรื่อง “กลยุทธ์ระบบการวัดผลการดำเนินงานแบบบูรณาการและความสำเร็จขององค์กร : การตรวจสอบเชิงประจักษ์บริษัทจดทะเบียนในตลาดหลักทรัพย์แห่งประเทศไทย” ซึ่งเป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปรัชญาดุษฎีบัณฑิต ดังนั้นเพื่อให้การดำเนินการเป็นไปด้วยความเรียบร้อยและบรรลุตามวัตถุประสงค์ คณะการบัญชีและการจัดการ มหาวิทยาลัยมหาสารคาม จึงใคร่ขอความอนุเคราะห์จากท่านเป็นผู้เชี่ยวชาญตรวจสอบเครื่องมือวิจัยและข้อเสนอแนะเพื่อนำข้อมูลที่ได้ไปดำเนินการทำวิทยานิพนธ์ต่อไปตามเอกสารแนบท้าย

จึงเรียนมาเพื่อโปรดพิจารณา

(รองศาสตราจารย์ ดร.การุณย์ ประทุม)

รองคณบดีฝ่ายบัณฑิตศึกษาและวิจัย

(รองศาสตราจารย์ ดร.ปพฤกษ์บาร์มี อุตสาหกรรมาณิชกิจ)

คณบดีคณะการบัญชีและการจัดการ

มหาวิทยาลัยมหาสารคาม





## บันทึกข้อความ

หน่วยงาน คณะการบัญชีและการจัดการ มหาวิทยาลัยมหาสารคาม โทรศัพท์ 043-754333 ต่อ 3431

ที่ ศธ.0530.10/

วันที่ 5 มิถุนายน 2559

เรื่อง ขอเรียนเชิญเป็นผู้เชี่ยวชาญตรวจสอบเครื่องมือวิจัย

เรียน ผู้ช่วยศาสตราจารย์ ดร.เกสินี หมั่นไธสง

ด้วย นางพรรณราย ละตา นิสิตระดับปริญญาเอก หลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาการบัญชี (ปร.ด.) คณะการบัญชีและการจัดการ มหาวิทยาลัยมหาสารคาม กำลังศึกษาวิทยานิพนธ์เรื่อง “กลยุทธ์ระบบการวัดผลการดำเนินงานแบบบูรณาการและความสำเร็จขององค์กร : การตรวจสอบเชิงประจักษ์บริษัทจดทะเบียนในตลาดหลักทรัพย์แห่งประเทศไทย” ซึ่งเป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปรัชญาดุษฎีบัณฑิต ดังนั้นเพื่อให้การดำเนินการเป็นไปด้วยความเรียบร้อยและบรรลุตามวัตถุประสงค์ คณะการบัญชีและการจัดการ มหาวิทยาลัยมหาสารคาม จึงใคร่ขอความอนุเคราะห์จากท่านเป็นผู้เชี่ยวชาญตรวจสอบเครื่องมือวิจัยและข้อเสนอแนะเพื่อนำข้อมูลที่ได้นำไปดำเนินการทำวิทยานิพนธ์ต่อไปตามเอกสารแนบท้าย

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2015 Pannarai Lata and Phaprukbaramee Ussahawanitchakit,  
(2015) "Management Accounting System Effectiveness and  
Goal Achievement: Evidence from Automotive Businesses in  
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