นวัตกรรมและผลการดำเนินงานขององค์กร: หลักฐานเชิงประจักษ์จากวิสาหกิจขนาดกลางของไทย

Innovativeness and Organizational Performance: The Empirical Evidence from Medium-Sized Thai Firms

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บทคัดย่อ

นวัตกรรมนับว่าเป็นตัวขับเคลื่อนสำคัญในการดำเนินงานขององค์กร ดังนั้นนวัตกรรมจึงมีผลโดยตรงต่อการเติบโตทางเศรษฐกิจของประเทศด้วย การวิจัยครั้งนี้เป็นการศึกษาความสัมพันธ์ระหว่างนวัตกรรมและผลการดำเนินงานขององค์กรจากวิสาหกิจขนาดกลางของไทย โดยงานวิจัยชิ้นนี้ได้ประยุกต์จากแนวความคิดสองเรื่องคือ แนวคิดเรื่องนวัตกรรมกับประเมินผลเชิงดุลยภาพ ซึ่งได้เก็บรวบรวมข้อมูลจากวิสาหกิจขนาดกลางของไทย 137 แห่งโดยใช้แบบสอบถามด้วยวิธีการสุ่มแบบชั้นภูมิ ทำการเก็บข้อมูลระหว่างเดือนพฤษภาคมถึงมิถุนายน พ.ศ. 2559 โดยผู้ตอบแบบสอบถามคือเจ้าของกิจการหรือระดับผู้จัดการ

ผลการวิจัยสนับสนุนแนวความคิดที่ว่า นวัตกรรมเป็นตัวสำคัญในการขับเคลื่อนองค์กรเพื่อสร้างองค์ความรู้และการเพิ่มประสิทธิภาพขององค์กร และสนับสนุนสมมติฐานที่ 1 2 และ 4 ผลการวิจัยครั้งนี้แสดงให้เห็นว่า วิสาหกิจขนาดกลางของไทยควรจัดหาทรัพยากรทางกายภาพให้ดีและเหมาะสม เช่น เทคโนโลยีเพื่อเพิ่มประสิทธิภาพการผลิตและกระตุ้นให้เกิดการปรับปรุงนวัตกรรมซึ่งอาจมาจากการนำเข้ามาของนักลงทุนต่างชาติ นอกจากนี้ วิสาหกิจขนาดกลางควรมีส่วนร่วมในการวิจัยที่เกี่ยวข้องกับนวัตกรรมเพื่อสร้างสรรค์ผลิตภัณฑ์และบริการใหม่ ๆ จัดการด้านเทคโนโลยีที่ดีให้เพียงพอกับกระบวนการการจัดการเพื่อพัฒนาประสิทธิภาพขององค์กรให้ดียิ่งขึ้น

คำสำคัญ : วิสาหกิจขนาดกลางของไทย นวัตกรรม ผลการดำเนินงานขององค์กร

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Abstract

It is thought that innovativeness is a key driver of organizational performance, consequently innovativeness has a direct effect on national economic growth. This research examines the relationship between innovativeness and organizational performance in medium-sized Thai firms. There are two concepts explaining the connection between innovativeness and organizational performance namely: the balanced scorecard (BSC). This research collected data from 137 Medium-sized Thai firms from Thailand using stratified random sampling method. The questionnaire survey (mail) collected during May-June, 2016. The key informants are owners and managers of these firms.

The findings support the concept that innovative drives, knowledge creation and applications factors positively affect organizational performance. This research suggests that medium-sized Thai firms should acquire the physical resources with appropriate technology to increase efficiency/productivity and encourage the improvement in innovativeness through foreign investors/ traders. Moreover, medium-sized Thai firms should participate in innovative research to create new products and services and maintain sufficient technology in process management to improve their performance.

Keywords : Medium-sized Thai firms, Innovativeness, Organizational performance

Introduction

According to Mok and Man (2009), small and medium-sized enterprises (SMEs) are significant engines of contemporary economic growth. The development of SMEs is widely seen as a key element of sustainable growth for a nation's economy particularly in countries such as Malaysia, Taiwan, and India. Further, the United Nations states that SMEs play a significant role in the growth of both developed and developing economics (United Nations, 1993).

Firms in today's highly competitive environment, characterized by high complexity and dynamism, need to devote special attention to the building and strengthening of their competitive advantages, which are a prerequisite to their survival, growth, and further development. The main way modern firms can improve and increase their performance and achieve competitive advantage is to be innovative in their businesses. There are ample studies that investigate the innovativeness and innovative activities in organizations. Most of these studies highlight the importance of innovation in gaining competitive advantage. Inmyxai and Takahashi (2012) state that contemporary competition essentially comes down to competition in innovation. Nevertheless, the majority of innovation research deals with innovation in large and mostly successful firms, while innovation in medium-sized firms has been only marginally investigated.

In Thailand, the most recent statistics from 2016 show that 39.6% of gross domestic product (GDP) comes from SMEs and 89.5% of GDP is in non-agricultural sector (NESDB, 2016). The GDP value of SMEs in 2015 was 5,559,534 million baht or 41.1% of the nation's GDP whereby the GDP value of SMEs expanded 5.3%, an increase from the 0.4% rise from 2014. When considering GDP value according to the size of enterprise, it was found that small enterprises (SEs) contributed 3,938,842 million baht to GDP, an increase of 5.7% from 2014 and being 29.1% of the total GDP. Regarding the GDP value contributed by medium enterprises (MEs) in 2015, this accumulated to 1,620,692 million baht, a 4.3% rise from the year earlier, equivalent to 12.0% of overall GDP (OSMEP, 2016).

As in many countries, in Thailand 99.72% of the total number of enterprises are SMEs (OSMEP, 2016), making these a significant proportion of the business population. However, unlike many countries, the Thai SMEs sector is characterized by micro enterprises. These firms employ fewer than five employees and make up 89% of the Thai enterprise population. This is significant when conducting techniques in which the owner/managers manage their firms and improve their quality of management, knowledge, and skills (Coetzer et al., 2011). Fuller-Love (2006) suggests that improving the management knowledge and skills of owner/managers of SMEs contributes to their survival and growth. Management knowledge and skills are generally considered to be a key factor in national economic growth and there has been specific interest in the concept of management capability and how to improve SMEs' performance. This is reflected in the 4th SMEs' Promotion Master Plan (2017-2021) (OSMEP, 2017) which states that in an effort to encourage Thai SMEs to play a bigger role in the Thailand's economy, all sizes of SMEs need to be developed. The main vision is to foster the growth of Thai SMEs, enabling them to compete in the international arena, and strengthening SMEs to become the main driving force of the Thai economy. This vision targets increasing the contribution of SMEs to total GDP in Thailand to at least 50% by 2021. Moreover, the main focus of this plan is to enhance Thai SMEs' competitiveness and to promote the growth of the Thailand's economy. This will improve SMEs' quality of management knowledge and skills and address key management challenges for Thai SMEs.

Lewis (2008), Marchese (2009), and Clark (2010) agree that innovation is a key factor in economic growth and social development. Therefore, the innovation process is considered at multiple levels of investigation, from national innovation systems, to regional growth strategies and as the basis for organizational performance and competitiveness (not only in the multinational or large firms but including SMEs). "As innovation essentially involves converting new ideas into action, the scope of innovation is wide ranging from developing new products and services, processes and technologies, to creating new markets or administration systems such as business models or procedures" (Clark, 2010, p. 601). Zawislak et al. (2013) states that firm improvement is based on how to coordinate

and integrate actions oriented towards the development of new goods and services. Dezdar and Ainin (2011) and Hipp, Gallego, and Rubalcaba (2015) state that the relationship between organizational innovation and performance is positive. Nowadays, firms innovate in order to gain competitive advantage, potential benefits and this in turn creates national economic flows.

This research is intended to provide a clearer understanding of the four innovativeness factors (innovative drives, knowledge creation, innovation and entrepreneurship, and application) and the relationship with organizational performance in Thai medium-sized firms. This research contributes to the literature of innovativeness and the balanced scorecard (BSC) looking at elements such as the financial perspective, customer perspective, internal business process, and learning and growth for theoretical and applied development. Most previous research focused on the SMEs or SEs but rarely looked at MEs. This research contributes by offering new insights related to the Thai medium-size firms' performance from the perspective of the main sources of innovativeness. It also looks at the specific innovativeness factors which Medium-sized Thai firms engaged in.

Therefore, the aim of this research is to empirically investigate the relationship between innovativeness and business performance in medium-sized firms in Thailand.

Purpose of the Research

The main purpose of this research is to examine the relationship between innovativeness and organizational performance in medium-sized Thai firms. The specific purposes of this research are as follows:

1. To investigate the relationship between medium-sized Thai firms' innovativeness and their organizational performance.

2. To offer new empirical insights to the presumed relationship between innovativeness and organizational performance in medium-sized Thai firms.

Research Questions

The key question of this research is, "How does innovativeness impact on the performance of medium-sized Thai enterprises. The specific research questions are as follows:

1. How do the innovative drives positively affect the organizational performance in medium-size Thai firms?

2. How does knowledge creation positively affect the organizational performance in the medium-size Thai firms?

3. How does innovation and entrepreneurship positively affect the organizational performance in the medium-size Thai firms?

4. How does application positively affect the organizational performance in the medium-size Thai firms?

Scope of the Research

There are two concepts explaining innovativeness and organizational performance in this research – the balanced scorecard (BSC). Innovativeness and BSC illustrate the relationships of medium-sized Thai firms.

This research is organized as follows: after the introduction section. Section Two reviews the literature on the relevant literature that focuses on innovativeness and BSC of medium-sized Thai firms. Section Three provides an overview of the data collection. Section Four presents findings and discusses the analysis. Finally, Section Five summarises the research and findings, including the policy implications as well as research limitations and suggestions for future research.

Literature Review and Conceptual Framework

This research provides empirical evidence of how innovativeness is a powerful factor in increasing organizational performance nowadays. The balanced scorecard (BSC) is used to measure organizational performance. To gain a deeper understanding of the relationship between innovativeness and the organizational performance in medium-sized Thai firms. The definition of Thai SMEs is presented in Table 1.

The SME Development Bank of Thailand (SME Bank) and the Office of SMEs Promotion (OSMEP) use the term SME to refer to firms with fewer than 200 million baht of fixed assets (manufacturing and services sectors) while classifying firms with more than 200 employees as large enterprises (LEs). Table 1 presents the definition of SMEs in Thailand.

Table 1: Definition of SMEs

Type	Small		Medium	
	No. of employee	Fixed assets excluding land (million baht)	No. of employee	Fixed assets excluding land (million baht)
Manufacturing	50 or less	50 or less	51-200	>50 to 200
Services	50 or less	50 or less	51-200	>50 to 200
Wholesale	50 or less	50 or less	26-50	>50 to 100
Retail	50 or less	30 or less	16-30	>30 to 60

Source: Annual Report 2015 (SME Bank, 2016)

Note:

1. The manufacturing sector includes industrial production, mining and agricultural production particularly agricultural processing

2. The trading sector includes wholesale, retail, import and export

3. The service sector includes businesses supporting manufacturing, trading, hotels and tourist related industries repair, transport and beauty salons, etc.

Theoretical Foundations

Innovativeness

Innovativeness is defined as the generation of a new idea and its implementation into a new product, process, or service, leading to the dynamic growth of the national economy and to create a profit for the innovative business enterprises (Urable, 1988). Moreover, Mok and Man (2009) state that the development of a new idea into a product, process, or service can increase an organization's market share and lead to a better performance. Organizations can enjoy several possible payoffs by effectively implementing innovativeness. Sankar (1991) suggests that organizations can benefit from increasing productivity and adaptability owing to process improvements. The implementation of new ideas can increase organization productivity and efficiency and lead to higher organizational performance (Edosomwan, 1989). Edosomwan (1989) also shows that effectively using an organization's new ideas can create an environment condusive to innovativeness as well.

This kind of development can create new opportunities for the organization and provides organizations with competitive advantages (Abernathy and Clark, 1988; Mok and Man, 2009). Innovation involves the commercial exploitation of new ideas to create new products, services and processes. Freeman (1982) and Damanpour (1991) state that specialization and organizational slack had significant effects on technical innovation. "The significance of innovativeness has been acknowledged conceptually but rarely examined empirically" (Mok and Man, 2009, p.4). The innovativeness can shorten the manufacturing cycle period and lower the costs and also create new products, product diversity and management processes by restructuring the organization (Mok and Man, 2009). This research has adopted the Mok and Man (2009) model in measuring Thai medium-sized enterprises that practice innovativeness and increase their flexibilities to the environment and improve the organizational performance. The research from Wattanasupachoke (2012) and Mehra et al. (2014) also show that innovativeness in SMEs provides a new operating environment for SMEs and improves organizational performance.

This research adopts the Innovation concept from Ciburiene (2009). Ciburiene (2009) suggests that there are four factors which are innovative drives, knowledge creation, innovation and entrepreneurship, and application. These factors are independent variables in the conceptual framework for this research.

Organizational Performance

Organizational performance is an indicator of how well an organization accomplishes its goals (Hao, Kasper, and Muehlbacher, 2012). Organizational performance measurement has for a long time been one of the dominant topics in the organization and management literature and large shifts have been taking place in organizational performance measurement. Three major issues have emerged which are (1) the balanced performance measurement system, (2) mapping of flows and transformation and (3) linking financial

and non-financial elements (Nelly, 1999). Many limitations of traditional performance measurement systems such as (1) encouragement of short-term review, (2) lacking strategic focus and failure to provide data on quality, responsiveness and flexibility, (3) encouragement of local optimization, (4) encouragement of managers to minimize riskiness and to improve continually, (5) failure to provide information on customer needs and how competitors are performing, (6) orientation to previous events, and (7) poor mutual integration between performance measures and their poor alignment to business process (Kaplan and Norton, 1992; Nelly, 1999; Malina and Selto, 2001; Garengo, Biazzo, and Bitici, 2005). The balanced performance measurement system was created by Kaplan and Norton (1992). It is one of the most significant developments in the managerial accounting literature and widely used in a comprehensive view of an organization's business. The balanced scorecard (BSC) supplements traditional financial performance management and divides the business environment into four perspectives which are (1) financial, (2) customer, (3) internal business process, and (4) learning and growth. For each perspective, it offers objectives, targets, measures, and initiatives. The model has been improved with the better organization and performance measures (Niven, 2007). The BSC remains the main development in recent managerial literature and the most implemented contemporary business measurement system (Hao, Kasper, and Muehlbacher, 2012).

Profitability can represent the overall achievement of the organisation (Luuk and George, 2001) and represents the return on invested capital (ROIC). Wattanasupachoke (2012) states that the performance measurement to be used in innovation evaluation consists of profitability and market share. This is related to two main dimensions of organizational performance: financial and customer perspectives. Mok and Man (2009) suggest measuring organizational performance in terms of effectiveness, efficiency, growth and productivity. However, Hansen and Birkinshaw (2007) hold that organizational performance can be measured in terms of financial measures and operational measures as well as behavioral measures. The financial measures of profitability and growth can be used to assess the financial performance of an organization. The operational measures which are productivity, resource acquisition, efficiency and employee reaction can be applied to assess the effectiveness of the firm as well as work support in organizations. And the behavioral effectiveness measures such as adaptability, satisfaction, absence of strain, development and open communication can be applied to determine individual performance.

Mok and Man (2009) suggest that the underlying differences in conceptualizing organizational effectiveness results from the different views concerning the nature of organizations that have, implicitly or explicitly, determined the conceptual definition of organizational effectiveness. The view of organizational performance can be a rational set of arrangements and emphasized toward achieving certain goals defined as effectiveness in terms of goal attainment. The open-system perspective of organi-

zations defines effectiveness as the degree to which an organization can maintain all its components.

The process of determining the organizational performance can be done in different ways depending on what are the most important drivers of any given business but whatever method is used, the selection and measuring of a set of key variables allows the organization to detect as well as monitor its competitive position in its market place. In other words, measuring performance is one of the important steps in the strategic control process (Mok and Man, 2009).

Balanced Scorecard (BSC)

Commonly, performance is defined as the attainment of a corporation's objectives and the output of the corporation's operations (Mehmood, Qadeer, and Ahmad, 2014). Organizational performance can be divided into three dimensions which are operational, financial, and organizational effectiveness (Venkatraman and Ramanujam, 1986). Mehmood, Qadeer, and Ahmad (2014) state that the operational or non-financial performance includes product quality, market share, market effectiveness, and new product introduction and financial performance includes profitability and sales growth.

Agarwal, Erramilli, and Dev (2003) state that organizational performance has two aspects which are 1) judgmental and 2) objective performance. While Burli, Kotturshettar, and Dalmia (2012) state that organizational performance is divided into three aspects which are 1) financial performance (profits, return on assets, return on investment etc.); 2) product/service market performance (sales, market share etc.); and 3) shareholder return (total shareholder return, economic value added etc.). Organizational performance is defined very broadly, therefore, some literatures have separated organizational performance into two dimensions as financial performance (such as shareholder return), and non-financial performance such as customer fulfilment, social concern, corporate citizenship, and community outreach. Curtis, Hannias, and Antoniades (2011) point out that as the environment is changing constantly, strategic management should be able to take into implementation of the business. The adoption of uncertainty, counted instability, and self-organization in the business, is changing the context of application. The organizational performance must be realigned with knowledge on uncertainty and thus should focus on identification of the knowledge accumulation as uncertainty and instability with increasing dynamism of the business environment.

The traditional BSC holds that a key dimension of financial and non-financial indicators and measures critical activities and processes in order to control implementation of a business strategy (Kaplan and Norton, 1992. BSC is a strategic planning and managing system that is used to align business activities to the vision and strategy of the organization. BSC can improve internal and external communication and monitor organization performance against strategic goals (Kostelac, Vukomanovic, and Ikonic, 2012).

The original four perspectives proposed by Kaplan and Norton, 1992 are:

· *Financial:* encourages the identification of a relevant high-level financial measure. In particular, the firm is encouraged to choose measures that help inform organization cash flow, sales growth, operating income, and return on equity.

· *Customer:* encourages the identification of the percent of sales from new products, on time delivery, share of important customers' purchases, and ranking by important customers.

· *Internal business processes:* encourages the identification of cycle time, unit cost, yield, and new product introductions.

· *Learning and growth:* encourages the identification of measures of the time to develop each new generation of products, life cycle to product maturity, and time to market versus competition.

The BSC provides owners/managers as a tool to achieve the future competitive success. Today, organizations are competing in turbulent environment. That means organizations should have an accurate understanding of their goals and methods for achieving their goals. The BSC transforms organizations' missions and strategies into a comprehensive set of performance measurement that provides the framework for a strategic measurement and management system (Kapland and Norton, 1996). Therefore, the BSC measures organizational performance across four perspectives: financial, customers, internal business processes, and learning and growth as shown in the model.

Relationship between Innovativeness and Organizational Performance

The ability of an organization to survive and succeed is influenced by various factors, some of which can and some which cannot be controlled. Therefore, organizational performance is a function of both controllable and uncontrollable variables (Wylant, 2008).

This research adopts the Innovation concept from Ciburiene (2009). There are four factors which are innovative drives, knowledge creation, innovation and entrepreneurship and application. These factors are independent variables in the conceptual framework. The distinction between organization and innovativeness is significant because it relates to a more general distinction between performance and technology.

Damapour (1991) and Han, Kim, and Srivastava (1998) state that organizational performance depends more on innovations of different types influencing and often completing each other. Innovation is more effective in supporting organizations to maintain or improve their performance levels. Zajac, Golden, and Shortell (1991) indicate that there is empirical support for a positive relationship between innovation and competitive intensity. Also Vos's (2004) research suggests that SMEs that practice innovativeness can improve their responsiveness to the environment through flexibility and improve organizational performance. Innovativeness in SMEs can provide a new operating environment for SMEs and improve organizational performance. The relationship between innovation and production of the or-

ganization is positive (Wallsten, 2001; Beal and Gimeno, 2002). However, this is contrary to Lin and Chen's (2007) research which suggests that 80% of Taiwanese SMEs applied technological innovation and the technological innovation factor has a weak relationship with sales.

As discussed above, many studies support the significance of innovation as it offers better response to the turbulent environment, increased market share, leading new knowledge and established the positive impact on the organizational performance.

Research Hypotheses

The following conceptual model shown here includes innovativeness and organizational performance. This research uses the factors of innovative drives, knowledge creation, innovation and entrepreneurship, and applications. Organizational performance is divided into four terms, following the BSC concept - financial, customer, internal business processes, and learning and growth. The overall hypothesis is that organizational performance is positively related to innovativeness factors. The research framework is proposed here shown in Figure 1.

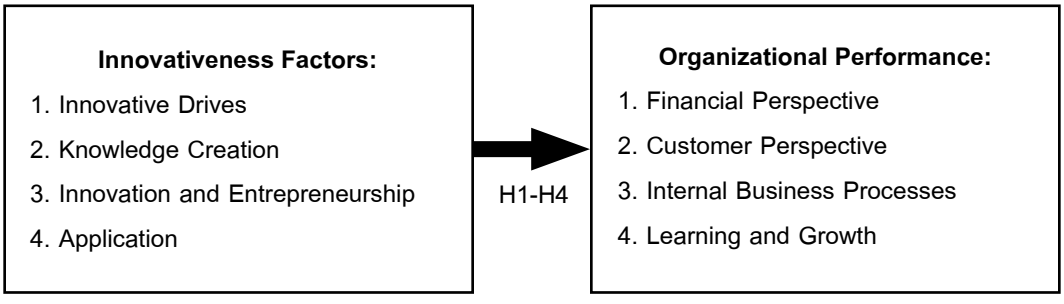

Figure 1: Research Framework

Thus, the hypotheses can be:

Hypothesis 1: Innovative drives positively *affect organizational performance.*

Hypothesis 2: Knowledge creation positively affects organizational performance.

Hypothesis 3: Innovation and entrepreneurship positively affect organizational performance.

Hypothesis 4: Application positively affects organizational performance.

Research Methods*Research Procedures*

First the population and sampling frames were determined in order to obtain an optimal sample size. Second, the survey questionnaire was developed, followed by a pilot test in which the instrument was revised accordingly. Data were then collected before analyzing based upon the research objectives and hypotheses.

This research adopts a cross-sectional field study based on a questionnaire-based survey because investigating innovativeness and organizational performance would be best

served in a real setting data through the literature review (Canham and Hamilton, 2013). A questionnaire-based survey is able to generate meaningful insights and thus enrich the discussion and implications sections of the research.

Population Selection and Data Collection Procedure

Population and Samples

This research was conducted in two phases. The first phase involved secondary research such as reviewing of relevant literatures, journals, publications, books, official reports, working papers, and related information. The second phase, the primary research, involved collection of primary data via structured questionnaires. The number of medium-sized firms in Thailand under the Office of Small and Medium Enterprises Promotion is 10,691 with regard to number of employees (50 -200) (SME Bank, 2016).

The sample size for this research is calculated according to the formula recommended by Yamane (1973) which is as below:

$$n = N/(1 + Ne^2)$$

where,

n = size of the sample,

N = population,

e^2 = probability of error.

Therefore, the sample size is:

$$n = 10,691/ [1 + 10,691 (0.05)^2]$$

with N = 10,691, e = 0.05 (at the 5% level of significance),

Thus the sample size is **386** respondents.

Data Collection

Data were collected from 386 medium-sized Thai firms. Population data was obtained from the Office of Small and Medium Enterprises Promotion (SME, 2016). The sample was selected using a stratified random sampling method.

The key informants were the entrepreneur, managing director or executive officer of each medium-sized firm in Thailand. The questionnaire mail survey was used to collect data in this research. This is appropriate because it is a widely-used method for large-scale data collection in a geographical area where mailing questionnaires is effective (Neuman, 2005). The questionnaires were directly distributed to each medium-sized firm in Thailand by mail. Then, the complete questionnaires were sent directly to the researcher by the prepared return envelopes within three weeks. The questionnaire survey (mail) collected during May-June, 2016.

With regard to the questionnaire mailing, 24 surveys were undeliverable because some medium-sized firm had moved to unknown locations or for other reasons. Deducting the undeliverable from the original 386 mailed, the valid mailing was 362 surveys, from which 142 responses were received. Of the surveys completed and returned, 137 were usable. There were 5 uncompleted. The effective response rate was 37.857%. According to Aaker, Kumar and Day (2001), 20% response rate for a mail survey, without an appropriate follow-up procedure, is considered sufficient. Furthermore, the maintaining power at 0.80 in multiple regressions requires preferably observations for most research situations (Hair et al., 2010). That means a correlation matrix is provided to test the intercorrelations among variables. If variables are highly correlated, and the correlation

coefficient is significant and greater than 0.8, thus the multicollinerity may occur. Table 2 shows the results of correlation is between 0.290 and 0.511. Therefore, the response rate of this research is regarded as acceptable.

Questionnaire

The questionnaire consists of three parts designed to address the research objectives. Part one asks for key informants' information such as gender, age, education level, working experience, and present position. Part two asks for general organizational information such as types of business, number of employees, initial investment, total firm's assets excluding land, and the firms' location. Part three is related to evaluating each of the items in the conceptual model and these are measured using a five-point Likert scale ranging from 1= strongly disagree to 5 = strongly agree with 3 as neutral point. According to Nunnally (1994) and Neuman (2005), the number of choices is usually better to use four to eight categories, more distinctions than that are not meaningful, and people will become confused. Therefore, using a five-point scale is appropriate. This part contains a question measuring the perception of the owner or managers with regards to innovativeness and organizational performance in their enterprises. All the items are drawn from the review of the literature and developed for measuring from the definition of each item. In part three, all questions deal with the measurement of innovativeness and organizational performance. The questionnaire uses closed-ended questions because it is easier and quicker for respondents to answer and easier to code and for statistical analysis (Tan et al., 2010).

Before the questionnaire was disseminated, it was piloted on 30 SMEs in Thailand in order to establish face validity (Cooper and Schindler, 2003). For this purpose, personal visits were made to interview the owners and managers and as a result, some minor modifications were carried out on the instrument.

Test of Non-Response Bias

A questionnaire survey has to be concerned with "non-response bias". Non-response bias refers to a situation in which informants who don't return a questionnaire have opinions that are systematically different from the opinions of those who return their surveys (Star Prairie Report, n.d.). The common technique to test for non-response bias is to compare the responses of those who return the first mailing group of a questionnaire to those who return the second mailing group. Respondents who return the second questionnaire group are, in effect, a sample of non-respondents (to the first mailing group) and this assumes that respondents in the second questionnaire group are representative of the non-respondents group. In this research, there were 69 people responded to the first mailing group and 68 people responded to the second mailing group. The early respondents make up a first group and the late responders are a second. Then a t-test was employed to compare the first and the second groups in terms of the demographic information of their enterprises such as types of business, number of employees, initial investment, total firm's asset excluding land, and the firms' location (Armstrong and Overton, 1977).

The types of business (t=.133, p > .05), number of employees (t =-.509, p > .05), initial investment total (t = .011, p > .05), total firms' asset excluding lands (t = -.668, p > .05), and firms' location (t = -.248, p > .05). The results showed that no statistically significant difference between early and late respondents of these two samples indicating non-response bias between respondents and non-respondents in terms of demographics. As a result, non-response bias does not appear to be a problem in this research.

Reliability and Validity

The constructs used in this research have been found to have high internal consistency reliability. This research assesses the reliability of each construct to assess the degree of consistency between multiple measurements of a variable. The item-to-total correlation and the inter-item correlation are used to test the internal consistency. The rationale for internal consistency is that the individual items should all be measuring the same construct and thus be highly intercorrelated. In this research, Cronbach's alpha is utilized to check the reliability of the instruments used for each of the constructs measured. Nunnally (1978) and Malhotra (2004) recommend that Cronbach alpha values should be more than 0.70.

Therefore this research pretested the questionnaires with a small set of respondents similar to those in the final survey as recommended by Neuman (2005). Following this thirty MEs owner and managers, who were involved with collaboration implementation for their firms, were asked specifically to comment on the clarity of the items and their relevance. This pretest provided a basis for a thorough statistical evaluation, including consideration of item response distributions, estimates of scale reliabilities, item-total correlation, and item scale discrimination.

The results for Cronbach's alpha coefficients for all variables in this research expressed between 0.706 and 0.786. The result are greater than 0.70 as recommended by Nunnally (1978).

The results from thirty firms in each sample in the pretest revealed that each item of all variables is loaded on only one factor. Furthermore, the factor loadings of each item are greater than the 0.40 cut-off and are statistically significant as recommended by Nunnally (1978). Consequently there is construct validity. In this research, the results found that each item of all variables is loaded on a single factor and the range of factor loadings is between 0.711 and 0.967. These values are greater than the cut-off score of 0.40 which indicates acceptable construct validity. As a result, the reliability and validity of all variables are assumed.

Measurements

This research investigated a cross-section of medium size enterprises drawn from innovativeness. To measure each construct in the research framework, all variables from the survey were analysed. There was one dependent variable and four independent variables of described below:

Dependent Variable

Organizational Performance is measured by a 12 item scale and it is defined as the results of business operations and activities that can increase the potential of management for both profit and non-profit organizations (Kostelac, Vukomanovic, and Ikonic, 2012). This scale measure is adopted from Kaplan and Norton (1992). There are four key perspectives such as customer, internal business process, financial, and learning and growth (Boonlua, 2016).

· *Customer Perspective (CL)*is measured by a three-item scale, and it is defined as the performance and activities that increase the value of services, goods, or a business. This encourages the identification of percent of sales from new products, on time delivery, share of important customers' purchases, and ranking by important customers

· *Internal Business Processes (OR)* is measured by a three-item scale. It is defined as the performance and activities that encourage the identification of cycle time, unit cost, yield, and new product introductions.

· *Financial Perspective (FN)* is measured by a three-item scale. It is defined as the performance and activities that encourage the identification of a relevant high-level financial measure. In particular, it is encouraged to choose measures that helped inform organization cash flow, sales growth, operating income, and return on equity.

· *Learning and Growth (LG)* is measured by three-item scale. It is defined as the performance and activities that encourage the identification of measures the time to develop new generation of products, life cycle to product maturity, and time to market versus competition.

Independent Variables

This research consists of four independent variables. These are innovative drives, knowledge creation, innovation and entrepreneurship, and application. The measure of each construct conforms to its definition are discussed as follows (Ciburiene, 2009):

Innovative Drives (ID) is measured by a five-item scale. It is defined as the contexts as government policy, education level, new techniques used, community, and users.

Knowledge Creation (KC) is measured by a four-item scale, and it is defined as organizations doing what is necessary to get the most out of knowledge resources that include both tacit and explicit knowledge (Sabherwal and Becerra-Fernandez, 2003).

Innovation and Entrepreneurship (IE) is measured by a four-item scale. It is defined as an acceptance of quality responsibility by the organization and department heads, evaluation of the top management on quality, top management participation in innovative improvement efforts, specificity of innovative goals, importance attached to innovativeness in relation to cost and schedule, and comprehensive innovative planning.

Application (AP) is measured by a seven-item scale. It is defined as an information technology. An application is the use of a technology, system, or product. It is designed to perform a specific function directly for the user or, in some cases, for another necessary program.

Statistical Techniques

Correlation analysis

Correlation analysis is a statistical technique which can show whether and how strongly pairs of variables are related. It measures the linear relation between two or more variables (Boonlua, 2015). The main result of a correlation is called the correlation coefficient (r) and ranges from -1.0 to +1.0. The closer r is to +1.0 or -1.0, the more closely the two variables are related. A value of 0.0 represents a lack of correlation (Gujarati, 2006). If r is positive, it means that as one variable gets larger the other gets larger also. On the other hand, if r is negative it means that as one gets larger, the other gets smaller, often called an "inverse" correlation.

Table 2 presents the Pearson correlation matrix of the research variables, which indicate the correlations among explanatory variables that are significant, the mean, S.D., and variance inflation factors (VIF) of the organizational performance (OP) and independent variables (ID, KC, IE, and AP). These variables do not appear to generate a multicollinearity problem as (VIF) scores are low (lower than 10) for all these variables (Gujarati, 2006). As shown in Table 2, it can be concluded that there is no problematic multicollinearity present in the results of any subsequent statistical tests in any of the model. In Table B, the value of Durbin-Watson test found that 1.54 confirms the values of all variables are in an acceptable range from 1.25 to 2.50 (Gujarati, 2006). According to Jaccard and Turrisi (2003), the evaluation of the variable and interaction effect will be undermined due to problems of multicollinearity, this research uses a VIF as indicators to indicate a high degree of multicollinearity among the independent variables. A rule of thumb is that when the VIF is equal or greater than 10, problems with multicollinearity are severe (Burns and Burns, 2008; Hair et al., 2010), that is multicollinearity greatly poses a problem for multiple regression such as limit the size of correlation, and increases variances of the regression coefficients. Table 2 shows the results of VIF is between 1.191-1.476. Therefore, the relationships between independent variables are not problematic.

The results from Table 2 found that innovative drives (ID) is rated as having the most agreement factors on average with the mean score of 3.87. Following the innovation and entrepreneurship (IE), applications (AP), and knowledge creation (KC) have average the mean scores of the agreement level at 3.72, 3.45, and 3.38, respectively.

The correlation matrix shows that the organizational performance (OP) has a positive correlation at the 1% level of significance with ID (.490), AP (.487), KC (.473), and IE (.352) indicating that as ID, AP, KC, and IE improve the better or higher in medium-sized Thai firms' performance.

Table 2 : Correlations Matrix

Variables	Mean	S.D.	OP	ID	KC	IE	AP	VIF
OP	3.93	.74	1					
ID	3.87	.72	.490*	1				1.191
KC	3.38	.98	.473*	.338*	1			1.476
IE	3.72	.96	.352*	.290*	.511*	1		1.470
AP	3.45	1.05	.487*	.309**	.379*	.406*	1	1.298

** , * Correlation is significant at the 0.01 and 0.05 levels (2-tailed), respectively

From the frequency and simple correlation analysis we can determine the agreement level of various factors affecting the organizational performance of the medium-sized Thai firms and the significance of the relationship. There are 20 independent variables grouped into four groups named as ID (innovative drives), KC (knowledge creation), IE (innovation and entrepreneurship), and AP (application) which are modified from the critical factors of innovation performance by Ciburiene (2009). The correlation matrix shows that the organizational performance (OP: dependent variable) has a positive correlation to all independent variables at the 1% level of significance. Consequently, there are four factors identified for the research including the innovative drives, knowledge creation, innovation and entrepreneurship, and applications that appear to impact on the organizational performance.

Multiple Regression Analysis

The Ordinary Least Squares (OLS) regression analysis is used to test all hypotheses following the conceptual model. The regression equation generated is a linear combination of the independent variables that best explains and predicts the dependent variable. Then, the OLS is appropriated to examine the relationships between dependent variables and independent variables when all variables are categorical and interval data (Gujarati, 2006). Therefore, all hypotheses in this research are transformed to equation for testing as follows:

$$OP = \alpha + \beta_1 ID + \beta_2 KC + \beta_3 IE + \beta_4 AP + \varepsilon$$

Where,

OP = Organizational Performance

ID = Innovative Drives

KC = Knowledge Creation

IE = Innovation and Entrepreneurship

AP = Application

α = Constant

β = Coefficient

ε = Error

Data Analysis

The questionnaires were checked upon receiving them in order to reduce the possibility of missing data before they were coded and entered into the software program. For subsequent statistical analyses, the descriptive statistics such as mean, frequency, percentage, and standard deviation (S.D.) are used. Inferential statistics such as sample t-test, Levene

statistics, correlation matrix, and regression analysis are used to identify whether there is any significant difference between variables of interests and to test the hypotheses.

Findings and Discussion

Characteristics of the Respondents

In this research, respondents are either an entrepreneur, managing director, or executive officer of each medium-sized firm in the sample who have an important direct influence on organizational performance. The respondent characteristics are described by demographic characteristics including gender, age, education level, working experience, and present position. The majority of respondents are male (89 respondents, 64.97%), aged between 36 and 40 years old (46 respondents, 33.58%), bachelors level of education (63 respondents, 45.99%), 11- 15 years of working experience (38 respondents, 27.74%), and department managers (48 respondents, 35.04%).

The results of firm characteristics of 137 medium-sized firms in Thailand indicate that most firms are in the manufacturing business type of which 64 respondents (46.71%) and the numbers of employees as of 51-100 employees (48 respondents, 35.04%). In addition, most of the respondents' firms fall into the 50,000,001-100,000,000 baht group of initial investment (64 respondents, 46.72%), 50,000,001-100,000,000 baht of total assets (74 respondents, 54.01%) and are located in Bangkok (42 respondents, 30.66%).

Hypotheses Testing and Findings

As explained earlier, the five-point Likert scale was used to measure the amount of innovativeness and organizational performance in each organization. The five-point scale was used to measure the amount of each variable in such a way that the mean score could be calculated to determine the amount of innovativeness and organizational performance. With a five-point scale the scores falling between the following ranges could be considered as:

4.51 – 5.00 Strongly agree
3.51 – 4.50 Agree
2.51 – 3.50 Neutral
1.51 – 2.50 Disagree
1.00 – 1.50 Strongly disagree

A multiple regression analysis was used for the quantitative analysis to examine the relationship between the dependent variable and the independent variables in the overall model (Greene, 2003). The research model and hypotheses are tested by using multiple regression models for analysis is presented in Table 3.

Table 3: Determinants of the Innovativeness and Organizational Performance Of the Thai Medium-Sized Firms

Independent Variables	Coefficients
Constant	1.313**
ID	.321**
KC	.187**
IE	.013
AP	.203**
No. of respondents	137
R^2	41.7%
R^2Adjusted	40.0%
F-Statistic	23.651
Durbin-Watson	1.537

** represents statistical significance at 1% level

* represents statistical significance at 5% level

Table 3 shows that the *F*-statistic is significant, suggesting that the model not only fits the data well, but also indicates the robust relationship between explanatory variables and dependent variable. The *F*-statistic failed to accept the null hypothesis that the estimated parameters are equal to zero. The results also show that the model explains a considerable amount of the variance in performance (adjusted R^2= 40.0% which the inclusion of performance improves the model's fit) (Inmyxai and Takahashi, 2009). The regression showed the estimated results of the determinants of the innovativeness and organizational performance of the medium-sized Thai firms moderate adjusted R^2 (40.0%). The multilinear regression analysis was employed to analyze 20 independent variables with the dependent variable, after the factor analysis extracted the variables. The Durbin-Watson test showed no presence of autocorrelation at the score of 1.537. There are three variables which are ID, KC, and AP positive and significant at the 1% level of significance. This suggests that the innovativeness and organizational performance of the medium-sized Thai firms is significant and positively affected by innovative drives, knowledge creation and applications factors. The innovation and entrepreneurship (IE) is positive but not significant. These suggest that the determinants of the innovativeness and organizational performance of medium-sized Thai firms depend on the employees' individual interest in innovation and the use of their own technology to apply to their work to create something new. The programs or budgets set by the employers are not significant. This suggests that the innovativeness in any firms' process in medium-

sized Thai firms will be positively associated with the probability of increasing organizational performance in Thailand. This evidence supports hypotheses 1, 2 and 4 at the statistical significance of 1% level of significance. Hypothesis 3 is not supported at the 1% and 5% levels of significance.

There are three hypotheses supported from which we can conclude that the innovativeness contributes to superior performance in Thai medium-sized firms. The findings can be ranked based on the size of the standardized β-coefficients. The strongest key factor is innovative drives (.321), followed by applications (.203), and knowledge creation (.187), respectively. The results of regressions in innovativeness factors indicate a positive relationship with organizational performance.

Innovative drives. The findings indicate that the innovative drives factor has a positive relationship with organizational performance. Medium-sized Thai firms with a clear innovative drive can increase their firm's growth. The innovative drives that lead the transformation to the knowledge and technology-based economy currently have enormous advantages for the firms (Bailetti, 2012). Bailetti (2012) also suggests that the combination of skilled employees, available capital, infrastructure, and record of successes makes it much more likely to improve the firms' performance. Moreover, governments, public-private partnerships, and development organizations across the world have attempted to emulate successful entrepreneurial firms to encourage innovative activity (Aulet and Murray, 2013). Some of those efforts in science, technology, engineering, and mathematics (STEM) fields have supported many industries throughout Thailand. Although some firms in Thailand may consider themselves to be in the technology business, the great majority increasingly rely on technology to operate and compete. A look at the growth of both technology industry jobs and those occupations that require STEM-related skills suggests that the pattern of growth is far more dispersed. This pattern is best measured by tracking the trajectory of STEM jobs, which cover technical skills across industrial sectors in Thailand. This is consistent with Ciburiene (2009) who found that the importance of innovations is emphasized for employees in enterprises. The firms can improve the innovative activities with leading and teaching, offering suggestions and generating ideas.

Therefore, the model supports hypothesis 1. The innovative drives factors have the strongest positive relationship with organizational performance, in medium-sized Thai firms.

Applications. This is about high-tech services, high technology exports, sales share of new-to-market products, sales share of new-to-firm products, and employment in medium-high/high-tech business. This is related to the organizational performance of Thai medium-sized firms. This supports hypothesis 4. The findings imply that medium-sized Thai firms need to focus or emphasize more on technology through production and operational process. Indeed, despite the social media boom, high-tech performance, much of the growth is from not only what we traditionally think of as "high tech" but also a broader realm of industries extending from trading and manufacturing to

business services (Aulet and Murray, 2013). The future of medium-sized Thai firms and their ability to meet major economic, social, and environmental challenges rests largely on how they adapt to and take advantage of changes in technology. There was a time when national economic development programs focused only on implementing big-dollar tax incentives and recruiting huge numbers of employees from other countries and pay them cheaper wage rates. In recent years, growing from within by supporting and expanding young employers and assisting new startups has become a stronger, if not the primary, focus of job-creation efforts. Many organizations have moved their strategies for business growth and are now working on the assumption that innovation and technology development drive growth and competitiveness in a 21st-century global economy. Technology entrepreneurship is distinguished from other entrepreneurship types (such as social entrepreneurship, small business management, and self-employment) by collaborative experimentation and production of new products, assets, and their attributes, which can be intricately related to advances in scientific and technological knowledge and the firm's asset ownership rights (Aulet and Murray, 2013). The innovative driven firms, which include a wider universe of entrepreneurial firms whose competitive advantage might be a process, service, or business model, are also an important piece of the puzzle for states wanting to foster a more innovative economy. The innovation driven technology-intensive businesses are viewed favorably for their potential and disproportionate impact on competitiveness, future economic growth, and prosperity.

Hence, hypothesis 4 is supported. The applications factors have positive relationship with organizational performance and relevant to Thai medium-sized firms.

Knowledge creation. This is defined as continuous transfer, combination, and conversion of the different types of information, as users practice, interact, and learn (Ciburiene, 2009). The ability to create new knowledge is often at the heart of the organization's competitive advantage. Knowledge creation is an act of knowing through practice, action, and interaction in the creation of new knowledge. Knowledge sharing and knowledge creation thus go hand in hand. Knowledge is created through practice, collaboration, interaction, and education, as the different knowledge types are shared and converted. Therefore, knowledge creation is also supported by relevant information and data which can improve decisions and serve as building blocks in the creation of new knowledge (Frost, 2014). The Medium-sized Thai firms can enable and encourage knowledge sharing, create a suitable work environment, provide systems that support the work process, provide knowledge workers with timely, relevant information and data by creating interplay between knowledge and knowing. It implies offering relevant courses and education, but most importantly allowing new knowledge to be created through interaction, practice, and experimentation. Thus, knowledge creation depends upon the mechanisms described in the subsection on knowledge sharing, combined with the ability to put knowledge into practice in an environment which supports interaction

and experimentation (Park, Chang, and Park, 2015).

Therefore, hypothesis 2 is supported. The knowledge creation factors have a positive relationship with organizational performance and relevant to Thai medium-sized firms.

In summary, the findings support that innovative drives, knowledge creation, and applications factors relate to the organizational performance. For innovation and entrepreneurship factors are not significant to organizational performance. In a general sense, the findings are consistent with previous studies in the overall model indicating that sophisticated employee skills and new technology improve organizational performance. Therefore, hypotheses 1, 2, and 4 are supported.

Policy Implications

The government can assist medium-sized Thai firms with policy implementation rules and regulations which can improve the business environment and innovative activity in order to support the growth of MEs (including SEs) in manufacturing, services, and trading (wholesale and retail) firms. This research hopes to contribute good information on the priority of strategy choices in selecting innovativeness dimensions which are suitable to firms. Since strategies differ among industrial sectors, the government can therefore adopt a positive policy measure to meet the need of MEs in order to increase their performance. Especially, the dimensions of innovativeness which have been accumulated from the role of innovation drives, knowledge creation, and applications seem to be a key competitiveness factor for ME firms. The innovation drives, knowledge creation, and applications factors are meaningful ingredients for innovativeness with positive significance for organizational performance for medium-sized Thai firms. Therefore, allocating and seeking funds to provide the innovative drives, knowledge creation, and applications by training, advice, mentoring, and consultation for ME firms are important for the firm's success. The government can support the development of these resources by providing the information about technology activity and encouraging them to conduct the innovative process research and the operational activities through the latest knowledge from the experienced government official or well-known foreign entrepreneurs. Additionally, as innovative drives factors are the main drivers for firm success, the government can conduct the fund to commercial banks for MEs and technology to simplify accounting system for firms to adopt accounting which would help provide reliable innovative measures to obtain ideas, concepts, creation, and development at the end. Finally, since innovative drives, knowledge creation, and applications factors are important key dimensions especially in medium-sized Thai firms, the government can promote innovativeness for the digital economy as the country's strategy.

For medium-sized Thai firms, sufficient programs in promoting innovative activities have more direct impact on their performance. In addition, medium-sized Thai firms should acquire the physical resources with appropriate technology to increase efficiency/productivity and encourage the improvement in innovativeness through foreign

investors/traders. Moreover, medium-sized Thai firms should participate in innovative research and continue to create new products and services; and maintain sufficient technology in process management in order to improve their performance.

Research Limitation and Future Research

Future research should conduct the survey and include other business sizes such as small or large firms. The economic factors such as sources of funds, interest rate, and loan variables can be considered as possibly affecting organizational performance. In addition, because of the limitation of the data, we could not measure the comprehensive performance indicators covered by all the financial statements. Therefore, future research should include comprehensive performance indicators such as return on assets, return on sales and sale growth. Lastly, to minimize the bias in the models, future research should control most aspects that have a potential to be influencing factors including leverage into the research.

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