# INNOVATION AND PERFORMANCE ON MANUFACTURING COMPANIES IN KOTA KINABALU, SABAH

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**DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT FOR THE DEGREE OF MASTER OF BUSINESS ASMINISTRATION**

**FACULTY OF BUSINESS, ECONOMICS AND ACCOUNTANCY**
**UNIVERSITI MALAYSIA SABAH**
**2015**

# UNIVERSITI MALAYSIA SABAH

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JUDUL KAJIAN: INNOVATION AND PERFORMANCE ON MANUFACTURING COMPANIES IN KOTA KINABALU, SABAH.

IJAZAH: MASTER OF BUSINESS ADMINISTRATION (MBA)

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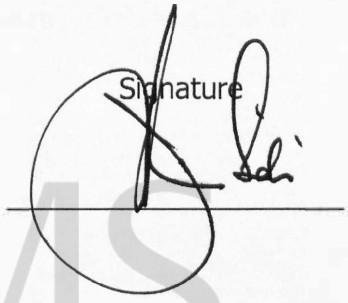

# ACKNOWLEDGEMENT

Working on this research, it really takes determination, commitment, planning and sacrifice. It was a self-fulfilling journey. I would like to thank all who aided in way or another in the writing of this dissertation.

To begin, firstly this is a great opportunity to express my respect and appreciation to Dr. Julian Paul Sidin, who has been an excellent supervisor. He was patient enough to advise, guide and supervise me throughout the past few months. Same goes to my lecturer of Research Methodology, Dr. Stephen L. Sondoh Jr who teach and guiding me with the precious knowledge that is very useful in making this dissertation. The immense knowledge shared was uncountable.

Greatest thanks to my family for their love, encouragement and support especially for my parent who encourage me and be there when I was down, give strength for me to be strong. Not forgot also my sincere appreciation to the administrative staffs in Faculty's Post Graduate Office, namely Mr. Husin and Mr. Rahman.

Ang Hong Loong
5 October 2015

# ABSTRACT

The purpose of this study is to examine the relationship between innovation, innovative and production performance amongst manufacturing companies in Kota Kinabalu with the moderating effect of year of establishment. In this study, innovation is conceptualized as a multidimensional construct which consist four dimensions of innovation (i.e. product innovation, process innovation, marketing innovation and organizational innovation). Managerial level employees whom are qualified to represent their manufacturing companies in making decisions are the participants in this study. Data from 323 respondents were used for the statistical analysis using Partial Least Squares Structural Equation Modeling. The data were collected using the disproportionate stratified random sampling approach. Measurement model, structural model and moderator analysis were employed to test the relationships between innovation, innovative performance and production performance with the moderating effect of year of establishment. The results showed that innovation are related to product innovation, process innovation and organizational innovation have a significant influence on innovative performance. In addition, there is evidence that innovation related to product innovation, process innovation and organizational innovation also have a significant effect on production performance. However, marketing innovation does not have a significant relationship with innovative performance and the relationship between marketing innovation and production performance is not supported. Furthermore, the year of establishment of organization moderates the relationship between innovation and innovative performance. Also, this year of establishment moderates the relationship between innovation and production performance. Specifically, this study found that the moderating role of year of establishment with a high year of establishment (11 years and above) has a positive relationship between organizational innovation and innovative performance, whereas low year of establishment (1 to 10 years) has a positive relationship between process innovation and production performance. The results imply that manufacturing companies in Kota Kinabalu should focus on innovation to achieve innovative performance and production performance.

# *ABSTRAK*

## *Inovasi dan Prestasi di Kalangan Syarikat Pembuatan di Kota Kinabalu, Sabah*

*Tujuan kajian ini adalah untuk mengkaji hubungan di antara inovasi, prestasi inovatif dan pengeluaran di kalangan syarikat pembuatan di Kota Kinabalu dengan kesan penyederhanaan bagi tahun penubuhannya. Dalam kajian ini, inovasi adalah suatu konsepkan pelbagai dimensi yang terdiri daripada empat dimensi inovasi iaitu inovasi produk, inovasi proses, inovasi pemasaran dan inovasi organisasi. Peserta kajian ini adalah pekerja peringkat pengurusan yang berkelayakan untuk mewakili syarikat-syarikat pembuatan mereka dalam membuat keputusan syarikat. Partial Least Squares Structural Equation Modeling telah digunakan untuk menganalisis statistik data daripada 323 responden. Data telah dikumpulkan dengan menggunakan pendekatan persampelan rawak berstrata yang tidak seimbang. Model pengukuran, model struktur dan analisis moderator telah digunakan untuk menguji hubungan di antara inovasi, prestasi inovatif dan prestasi pengeluaran dengan kesan yang sederhana tahun penubuhannya. Hasil kajian menunjukkan bahawa inovasi yang berkaitan dengan inovasi produk, inovasi proses dan inovasi organisasi mempunyai pengaruh yang besar ke atas prestasi inovatif. Di samping itu, terdapat bukti bahawa inovasi yang berkaitan dengan inovasi produk, inovasi proses dan inovasi organisasi juga mempunyai kesan yang besar ke atas prestasi pengeluaran. Walau bagaimanapun, inovasi pemasaran tidak mempunyai hubungan yang signifikan dengan prestasi inovatif dan hubungan adalah tidak disokong antara inovasi pemasaran dan prestasi pengeluaran juga adalah tidak disokong. Tambahan pula, kesan penyederhanaan bagi tahun penubuhan dalam hubungan di antara inovasi dan prestasi inovatif adalah disokong. Ini adalah sama bagi kesan penyederhanaan bagi tahun penubuhan dalam hubungan di antara inovasi dan prestasi pengeluaran. Secara khususnya, kajian ini mendapati peranan dari kesan penyederhanaan bagi syarikat yang mempunyai tahun yang lama penubuhannya (11 tahun ke atas) mempunyai hubungan yang positif antara inovasi organisasi dan prestasi inovatif, manakala bagi tahun yang kurang tahun pertubuhannya (1 hingga 10 tahun) mempunyai hubungan yang positif antara inovasi proses dan prestasi pengeluaran. Walau bagaimanapun, tahun penubuhan tidak mempunyai kesan penyederhanaan terhadap hubungan di antara inovasi produk, inovasi proses, inovasi pemasaran dan prestasi inovatif. Selain itu, tahun penubuhan juga tidak mempunyai kesan penyederhanaan terhadap hubungan di antara inovasi produk, inovasi pemasaran, inovasi organisasi dan prestasi pengeluaran. Keputusan kajian menunjukkan bahawa syarikat-syarikat pembuatan di Kota Kinabalu perlu memberi tumpuan kepada inovasi untuk mencapai prestasi yang inovatif dan prestasi pengeluaran yang baik.*

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# CHAPTER 1

# INTRODUCTION

## 1.1 Introduction

The manufacturing sector is an important factor that contributes to economic growth of a country (Santhapparaj, Srinivasan & Ling, 2005). This is prevalent in Malaysia and Sabah with the growth of 8 percent per annum in Malaysia (Rozilee Asid, 2010) and it being one of the targeted sectors for development under the Sabah Development Corridor (Sabah Institute for Development Studies, 2007). The study searches to verify the correlation between innovation, innovative and production performance with the moderating effect of year of establishment amongst manufacturing companies in Kota Kinabalu, Sabah. There are nine sections in this chapter. Section 1.2 explained the background of the study and followed by the research problem identified in section 1.3. The research questions and objectives are determined in section 1.4 and 1.5 respectively. The scope of the study explained in Section 1.6 while the significance of the study is explained in section 1.7. Next, definitions of key terms are clarified in section 1.8. Finally, section 1.9 briefly described the organization of chapters for this study while the short summary presented in the last section of this chapter.



## 1.2 Background of the Study

The manufacturing sector is firstly introduced in this section followed by the theory of Resource-based View (RBV) as the basis theoretical research in this study. Dependent variables (innovative performance and production performance), independent variables (product, process, marketing and production innovations) and the moderating effect (year of establishment) are introduced and briefly described as part of the main topic of literature for this study.

### 1.2.1 Manufacturing

In this 21st century, manufacturing companies are facing challenges on upgrading contemporary technologies constantly (Juhaini Jabar, Soosay, Norfaridatul Akmaliah Othman & Md. Nor Hayati Tahir, 2011). The manufacturers are working hard on investigating their strategies in order to improve their innovation capabilities that can make them stay competitive in the industry (Ireland & Hitt, 1999). Corporate strategies could be enhanced with innovation to provide a more productive manufacturing process, gain higher performance in the marketplace, satisfy customers as well as obtain competitive advantage (Gunday, Ulusoy, Kilic & Alpkan, 2011). Hassan, Shaukat, Nawaz and Naz (2013) further supported that stimulation of innovation is a prior requirement that is necessary for manufacturing companies to gain competitive advantage in global markets. According to Afdiman Anuar and Rosnah Mohd Yusuff (2011), manufacturing companies used to be competitive by depending on pricing and product quality. However, nowadays they have to strive with all competitive elements including innovativeness, higher agility and understanding customers' reaction in the present economic situation. Meanwhile, manufacturing companies have been leading economic growth steadily due to the intense competition in the market, and through innovation and changes of its requirements such as capital, resources, advanced technology and high quality labor force (Sidin, Zatul Karamah & Sinun, 2003).



### 1.2.2 Manufacturing in Malaysia

Malaysia is one of the emerging, newly industrializing countries. Others countries includes Thailand, Indonesia and Philippines (Zha, 2000). Sirat (2000) citing from Sidin *et al.* (2003) stated that Malaysian manufacturing and plantation are the most competitive industries in Malaysia's economic activities as compared to other industries. According to the Minister of International Trade and Industry, Malaysian manufacturing sector invested RM33.6 billion from RM57.4 billion of total accounted investments in Malaysia for the first quarter of the year 2015 (Malaysian Investment Development Authority, 2015). The investment largely came from Petroliam Nasional Berhad (Petronas) for its business expansion and diversification. Other than that, there is also a large amount of investment from the small and medium sized enterprises (SMEs) which aims to create more job opportunities in Malaysia. The minister emphasized that the manufacturing sector in Malaysia is

able to generate 27,553 jobs opportunities and equally contribute to each industry group typically in the electrical and electronics industry, engineering and chemical industries (Malaysian Investment Development Authority, 2015). Other industries showed an encouraging prospect to generate job opportunities in 2015 as well.

### 1.2.3 Manufacturing in Sabah

Sabah, a state in Malaysia is one of the most competitive industrial-based states in Malaysia (Sidin *et al.*, 2003). The authors further convince that the strengths of Sabah's industries came from its production sectors including manufacturing and agriculture industries. One of the main manufacturing based areas reported by State Legislative Assembly 2014 in Sabah is the Kota Kinabalu Industrial Park (KKIP) in Kota Kinabalu. Other manufacturing based areas are Palm Oil Industrial Cluster (POIC) and Sipitang Oil and the Gas Industrial Park (SOGIP) located in Lahad Datu and Sandakan (Daily Express, 2014). Sabah manufacturing sector has obtained the most market share of the state. Major products of Sabah manufacturing include palm oil (base oil and process), petroleum, palm kernel oil, plywood, timber as well as fresh and frozen seafood (Sidin *et al.*, 2003). Meanwhile, the imported items of Sabah are supplied from Peninsular Malaysia, Japan, European Union and United States that includes items such as vehicles, apparatus for specific industries and electrical equipment and devices. In addition, Sabah's export commodities are largely dependent on resource-based products such as food, beverages and tobacco, manufactured goods and others as showed in Table 1.1 and 1.2.

**Table 1.1: Imports by Commodity (RM million)**

| Commodity | Jan-Dec 2011 | | Jan-Dec 2012 | |
|---|---|---|---|---|
| Machinery and Transport Equipment | 9,293.0 | 28.4% | 11,718.9 | 31.3% |
| Manufactured Goods | 4,644.4 | 14.2% | 6,485.8 | 17.3% |
| Food | 3313.2 | 10.1% | 3,759.4 | 10.0% |
| Chemical Products | 3,665.0 | 11.2% | 3,637.6 | 9.7% |
| Mineral Fuels, Lubricants, etc. | 6,966.9 | 21.3% | 6,705.6 | 17.9% |
| Misc. Manufactured Articles | 2,095.3 | 6.4% | 2,334.4 | 6.2% |
| Beverages and Tabacco | 698.7 | 2.1% | 811.5 | 2.2% |
| Crude Materials Inedible | 1,067.3 | 3.3% | 981.1 | 2.6% |
| Misc. Transactions and Commodities | 163.0 | 0.5% | 142.1 | 0.4% |
| Animal/Vegetable Oils and Fats | 865.3 | 2.6% | 892.3 | 2.4% |
| **Total Import** | **32,772.1** | **100.0%** | **37,468.8** | **100.0%** |

Source: Monthly Statistical Bulletin Malaysia, January 2013

**Table 1.2: Exports by Commodity (RM million)**

| Commodity | Jan-Dec 2011 | | Jan-Dec 2012 | |
|---|---|---|---|---|
| Food | 9,293.0 | 2.4% | 11,718.9 | 2.5% |
| Beverages and Tabacco | 4,644.4 | 0.1% | 6,485.8 | 0.1% |
| Crude Materials Inedible | 3313.2 | 4.2% | 3,759.4 | 0.4% |
| Mineral Fuels, Lubricants, etc. | 3,665.0 | 35.8% | 3,637.6 | 42.0% |
| Animal/Vegetable Oils and Fats | 6,966.9 | 44.4% | 6,705.6 | 38.8% |
| Chemical Products | 2,095.3 | 3.4% | 2,334.4 | 3.9% |
| Manufactured Goods | 698.7 | 6.5% | 811.5 | 5.8% |
| Machinery and Transport Equipment | 1,067.3 | 2.6% | 981.1 | 2.7% |
| Misc. Manufactured Articles | 163.0 | 0.5% | 142.1 | 0.6% |
| Misc. Transactions and Commodities | 865.3 | 0.1% | 892.3 | 0.2% |
| **Total Export** | **49,395.2** | **100.0%** | **47,772.4** | **100.0%** |

Source: Monthly Statistical Bulletin Malaysia, January 2013



As stated in the beginning of this chapter, the manufacturing sector is one of the major growth industries for Sabah's economy. To foster the investments in Sabah, Sabah Economic Development and Investment Authority (SEDIA) and Malaysian Investment Development Authority (MIDA) have been cooperating to attract more investments through promoting Sabah Development Corridor (SDC). Table 1.3 has showed the value of approved manufacturing projects in Sabah from 2005 to 2014.

**Table 1.3: Approved Manufacturing Projects in Sabah from 2005 to 2014**

| Year | Capital Investment | | Potential Employment (RM million) |
|---|---|---|---|
| | Domestic (RM million) | Foreign (RM million) | |
| 2005 | 900 | 300 | 2,233 |
| 2006 | 4,200 | 800 | 4,628 |
| 2007 | 1,100 | 2,200 | 2,820 |
| 2008 | 600 | 300 | 3,244 |
| 2009 | 400 | 5,200 | 2,509 |
| 2010 | 800 | 500 | 3,481 |
| 2011 | 900 | 0 | 1,648 |
| 2012 | 4,800 | 300 | 2,153 |
| 2013 | 2,400 | 1,000 | 1,873 |
| 2014 | 2,400 | 500 | 1,796 |

Source: Ministry of International Trade and Industry (MITI), 2015

Furthermore, the Sabah state government has been actively participating in international investment and commerce markets to diversity its business aspect for the state. The main trading partners of Sabah are showed in Table 1.4. Internationally, the two main consistent trading partners of Sabah are China and Japan. As expected, the Peninsular Malaysia trades the most with Sabah due to less constraint in trading regulations and communications.

**Table 1.4: Sabah Main Trading Partners (Export) (RM million)**

| Country | 2011 | 2012 |
|---|---|---|
| Peninsular Malaysia | 5,791 | 6,031 |
| Japan | 2,704 | 2,664 |
| China | 10,915 | 8,699 |
| Singapore | 1,133 | 1,192 |
| Sarawak | 2,400 | 2,095 |
| Korea Republic (South Korea) | 2,733 | 1,795 |
| USA | 1,816 | 1,293 |
| Taiwan | 729 | 601 |
| Thailand | 2,474 | 2,209 |
| Netherlands | 2,089 | 2,269 |
| **Grand Total** | **49,395** | **47,772** |

Source: Monthly Statistical Bulletin Malaysia, January 2013

As trading of import and export in Sabah industries is high, there is a need for large numbers of employment in order to arrange its resources and capital investment. The demand for these human resources in professional, scientific and technical sectors is mainly focused in the agricultural, forestry and fishing industry as shown in Table 1.5.

**Table 1.5: Number of Employment by Industry in Sabah from 2010 to 2011 (in Thousands)**

| Industry | 2010 | 2011 |
|---|---|---|
| Agricultural, forestry and fishing | 527.2 | 410.5 |
| Mining and quarrying | 5.3 | 6.4 |
| Manufacturing | 131.0 | 169.3 |
| Electricity, gas, steam and water | 9.9 | 11.0 |
| Construction | 124.8 | 140.6 |
| Wholesale and retail trade | 235.5 | 257.7 |
| Transportation, storage and communication | 63.3 | 71.1 |
| Accommodation and food service activities | 80.6 | 96.0 |
| Finance, insurance, real estate and business services | 22.6 | 25.4 |
| Others | 307.6 | 366.8 |
| **Total Employment** | **1,507.8** | **1,554.8** |

Source: Yearbook of Statistics Sabah, 2011



### 1.2.4 Resource-based View

The literature of the study conducted Resource-based View (RBV) theory as the basic concept for investigating innovation antecedents on innovative and production performance. The RBV theory is one of the more important theories in strategic management correlated to innovation (Lawson & Samson, 2001). RBV can contribute a more systematic approach in organization-level analysis by characterizing the organization as a collection of resources and capabilities rather than emphasize on product market positions (Wennerfelt, 1984). RBV estimates that company's performance, especially innovative and production performance can generate different results among companies depending on their valuable and rent-generating, resources and abilities that cannot be easily replicated or substituted by other competitors (Amit & Schoemaker, 1993; Dierickx & Cool, 1989).

### 1.2.5 Innovative Performance

Organizations often evaluate its innovative performance through integrated organizational accomplishments, such as process, product or service and organizational constitution (Hagedoorn & Cloodt, 2003). It can determine whether the organization should carry out efforts of renewing or enhancing its existing products, processes, marketing and organizational approaches or totally create the new one in the market (Gunday *et al.*, 2011). Innovative performance has been identified as a vital role compared to other dimensions such as organizational performance because it can be cooperatively interact with innovation dimensions to promote significant positive outcomes for the organization development and financial gain (Hagedoorn & Cloodt, 2003). Pelham (1997) further explained that attracting new and existing customers in terms of their satisfaction was strongly correlated with innovative performance to gain sales and stock market. Hassan *et al.* (2013) further emphasized innovative performance is an indicator for production, monetary and marketing performance.

### 1.2.6 Production Performance

Production performance focuses on organizations' product and process innovations through its speed on production, quality control, agility and cost effectiveness as sources for competitive advantage (Gunday *et al.*, 2011). Koufteros and Marcoulides (2006) postulated that high innovation and acquaintance are able to increase production performance by stimulating organizational learning among employees in an organization. A high learning organization is able to enhance its speed of production through its technological development that is capable to improve on its shortage of production process and product quality (Koufteros & Marcoulides, 2006). The authors further explained production quality can be increased by implementing Total Quality Management (TQM) through innovativeness as the driving force in an organization's innovative process. For flexibility and cost effectiveness, Koufteros and Marcoulides (2006) suggested that information sharing and cooperation within organizations are able to enable the organizations to be more flexible and reduce production cost. Thus, production performance can be positively affected by the innovation.

### 1.2.7 Innovation

Innovation is important for organizations to succeed in the business and economics world (Hult, Hurley & Knight, 2004). It is also a potential growth instrument for creating something new and in unconventional ways for its products or services, processes, marketing strategies as well as organizational approaches or practices (Gunday *et al.*, 2011). Morris, Kuratko and Covin (2011) alluded that innovation is also the founding factor of new technologies and business models. Indeed, most of the organizations believed that understanding innovation itself is capable to contribute knowledge, trademark, systematic organization management and culture among employees in organizations (Telbani, 2013). From the financial perspective, innovativeness is capable to assist the generation of financial gain and develop organization's growth (Drucker, 2002; Morris *et al.*, 2011). Therefore, it is found that nowadays, every organization or firm is gaining interests on innovation due to the higher expectation on innovative performance, production performance and to uphold competitive advantage in domestic and international markets (Morris *et al.*, 2011; Gunday *et al.*, 2011). Thus, innovation has been identified by Drucker (2002) as one of the motivators to promote strategic direction by solving problems of an organization and pursue uphold competitive advantage (Drucker, 2002) and in turn, ensuring elevated profit for an organization.



### 1.2.8 Year of Establishment

In this study, year of establishment represents how long a manufacturing company has been operating in business (Brown & Medoff, 2003). The company's internal processes of innovation can be evaluated based on their transformation over time, i.e. the period of business operation evaluated by year (Naldi & Davidsson, 2013). Behrman and Deolalikar (1989) explained that the durability of company's establishment relies on several factors including market position, availability of resources, management skills and networking. Some of the factors can be controlled by the establishment while others simply cannot (Behrman & Deolalikar, 1989). These factors that affects year of establishment for an organization will lead to different effects on organization's growth. For instance, organizations that advanced in years are more innovative due to their ability to exploit new products and processes because they have sufficient financial resources to support research and development (R&D). However, it will depend on the emphasis each