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The Relationship of Export Intensity and Innovation Performance: Testing Moderating Effect of MNCs

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Abstract:

Innovation is a crucial factor that increasing firm performance and generating competitive advantage. However, previous studies are limited attention to investigating the relationship between exporting intensity and innovation performance, from a multinational company perspective. This study aims to testing how moderator effect on the relationship between export intensity and innovation performance. The population in this study is multinational company in nine industrial sectors (Processing Food, Textile, Garment, Auto Parts, Electronics, Electrical Appliances, Rubber and Plastic, Furniture, Machinery and Equipment sectors) in Thailand.. Multiple linear regression is used for data analysis. The empirical results of this study increase the understanding that the relationship between export intensity and innovation performance. I found that a positive relationship between export intensity and innovation performance is more likely to occur if firms have embeddedness (longevity of foreign businesses with a specific market) and presence of MNCs.

Keywords: *Export intensity, innovation performance, multinational company, MNC embeddedness, MNC Presence*

1. Introduction

Currently, businesses in the world are becoming increasingly interconnected across national boundaries, allowing companies to expand ever further afield. Once a company has maximized its growth potential in its home market, the best option for further growth is international expansion. For this reason, many companies are seeking to acquire a greater share of global markets because of globalization and international competition. The current competition is not only given to either the production cost or the quality of goods and services, but also to produce the products and services to meet customer expectations with unlimited and worldwide.

The export is considered to important activities that gain income into a country. In each country should focus on industries which they have specialize to engage in the market by export the goods for it has a comparative advantage to gain overall consumption hence export activity will gain income to home country and gain advantage in the international market. Export performance affects the assessment of exporting as one of the business activities that cause revenue to the company (Carneiro, Farias et al., 2013). Export performance is involved in the evaluation process of company strength and advantages. Many scholars argued that companies that improve their productivity and can make larger productivity are capable of exportation. Obviously, from pervious studied productivity are increasing export intensity, however, the cost is the essential concern for do business and take competitiveness. If company can reduce production cost it allows company to gain income and benefit in exporting activities. A globalization of business activities is interesting areas when taking about multinational company (Li & Hsieh, 2009).

In the new era of market competition, growing cross-border trade and investment force companies to become more multinational in order to survive and grow in globalization (Cullen & Parboteeah 2005). Globalization strengthens the perspective of multinational corporations (MNCs) as globally uniform organizations, increasing worldwide convergence and standardization of corporate practices and processes. In order to successfully market and sell products and services in overseas markets, companies frequently attempt to find foreign partners or to set up foreign subsidiaries (Wright et al., 2002). For developing economies, foreign investment brings in expertise, technology, qualified personnel, finance, and access to higher standards within any given industry (Gillespie & Teegen, 1995). When additional knowledge or skills are required in order to trade internationally, foreign partners can often be the best source to meet these needs (Hoskinsson et al., 2000).

Exporting is one of the key factors in economic development, particularly in developing countries. In Thailand, a declining trend in exports is all considered negative aspects of economic development because more competitors in the world export markets and lower competitiveness in innovation. Systematic research is needed to understand a country's export business, especially MNCs international marketing which will enable local subsidiaries to set up sustainable businesses and to make great development for higher competitive advantages.

In reviewing export performance literature, export growth and other types of export performance are functionally dependent on a country's demand for goods and service. While export performance and firm innovation are frequently viewed as interlinked, with technology considered the major factor, no empirical study views the innovation in other aspects beyond the technological framework. However, a number of researchers have suggested that the use of innovation strategy for organizations and countries is considered a

sustainable. This study empirically examines the role of export performance in the meaning of export intensity. Potter (1990) points out, both new technology and new production methods or management processes can be considered as innovation. Innovation can shift competitive advantage when a competitor is unable to perceive new patterns of competition or unable to respond. Although, in term of innovation performance, knowledge is one of the most important factors in an industrial cluster (Lai et al., 2014), the effect of export intensity on innovation performance and the role of MNC (Multi National Company) as moderator are seldom the focus of discussion.

This study review a lot of work done in the areas of examining export performance in term of export intensity, multinational corporation performance and innovation performance. Despite an extensive number of innovation studies, the answer of relationship between export performance and innovation performance is still relatively ambiguous. Especially, there are few studies that investigate the relationship among export intensity, innovation performance and multinational corporation performance. Since there is very little empirical studies to what extent MNCs as moderator, it is interesting to survey such embeddedness of MNCs and presence of MNCs applied to their local subsidiaries.

A much less studied aspect is the externalities from MNCs presences and embeddedness to local subsidiaries. The attempt to investigate these effects of MNCs on the performance of local subsidiaries could potentially serve as to solve the puzzle on whether the benefits of MNCs to the local subsidiaries are coherent in the conceptual frameworks. In addition, I perceive that the question of whether MNCs controlled local subsidiaries should be addressed prior to the impact study. Therefore, a closer examination on MNCs performance both export performance and innovation performance of the local subsidiaries are also empirically verified in this study.

2. Literature Reviews and Research Hypotheses

Much of the research relating to MNCs includes studies focused at company's internationalization process, entry mode decisions, foreign subsidiaries and foreign managers (Werner, 2002). Furthermore, the nature of internal knowledge sharing and communication channels has been examined. Foreign subsidiaries typically bring local knowledge and a range of skills which make them invaluable as a source of expertise for foreign parent companies wishing to break into local markets (Johansen, 2007). Foreign subsidiaries can thus be seen as vital if MNCs are to be able to compete successfully internationally, because they provide these essential strategic attributes to their parent organizations (Birkinshaw, 1996).

Expanding overseas, especially to culturally distant locations such as Thailand is not a simple process for MNCs. When companies adopt the GVC (Global value chain) model, they can take advantage of various strategic pathways. Value chains incorporate every stage of production for a company's products and services, from the formulation of the concept to the delivery of the product to the end user. Research and development, product design, manufacturing, marketing and distribution all form parts of the overall process to meet the demands of the consumer. It is possible to have the whole of a value chain contained within one firm, and equally it can be divided among a large number of different firms in different locations. When the locations are especially diverse, extending to different countries, the result is a global value chain.

One example might begin with Firm A, in France, with an R&D section in Germany, carrying out its manufacturing in Mexico using raw materials obtained from Nigeria. The product could then be sold in Australia and supported by an aftersales service call centre based in India. Each individual business focuses on its own specialization, leading to higher standards than would be achieved if once firm had to complete every stage itself. The global value chain thus helps its participating companies to organize their activities in such a way as to reduce their costs while delivering higher quality to the customers and increasing market share through productivity gains. However, the focus of recent research has largely been on the scope and coordination of MNCs managerial global value chain to their subsidiaries (Johansen, 2007). As the result, global value chain usually leads to knowledge sharing and transferring to local partners or local subsidiaries

On the other hand, I cannot conclude that MNCs integration global value chain will lead to transfer knowledge to local subsidiaries. Therefore, the relationship between MNCs' integration global value chain and local subsidiaries is far from consensus due to its depend other context; for example, knowledge transfer can sometime take place of its own accord via embeddedness and presence. I can also infer that the relationships within the value chain can be applied to research and development, design, production, marketing, distribution activities, and decision making. Therefore, I develop hypotheses to examine three moderating effects whether MNCs embeddedness and MNCs presence, can effectively the relationship of the export intensity on innovation performance.

2.1. Moderating Effect of MNC Embeddedness

The concept of embeddedness is such that it can only occur over a period of time. It is closely correlated to the length of time an MNC has been operating in a foreign market (Saliola and Zanfei 2009). When companies have been operating in a foreign market for a long period of time, it can be expected that they are familiar with the local norms and are thus perceived to be more trustworthy and can more easily enter into successful business arrangements (Vaccà, 1996; Burchell and Wilkinson, 1997).

Embeddedness demands the existence of complex networks of relationships involving local businesses and other institutions. The interactions of the MNCs through these networks result in the MNC gaining greater access to local skills and knowledge as the relationships become stronger over time (Saliola and Zanfei, 2009). There is also an element of each party adapting to the norms of the other when embeddedness takes effect. When MNCs are able to adapt to local methods and norms, such as by implementing local human resources practices and developing products with local markets in mind, they are better able to improve their performance and achieve greater success in the local market (Rosenzweig and Nohria, 1994; Andersson et al., 2005). In order to adapt effectively, it is necessary to know and understand the local context. Achieving such knowledge and understanding is best accomplished by connecting with local institutions and firms, such as the subsidiary.

The embeddedness of MNCs will also manifest itself in the departments of subsidiaries responsible for research, strategy and technological. This is because the technological capacity of an organization is important in adapting to new markets, transferring technology, and producing technological innovations. Where MNCs are able to diversify their technological abilities across different countries, it is possible for unique groups of technological expertise to be formed. Embeddedness allows MNCs to develop a global perspective in terms of technology, research and development, and global innovation.

Embeddedness is not a singular notion, since it incorporates both technical and social dimensions (Uzzi 1997). This research study will focus primarily on the technical or structural aspect using two key factors: age and adaptation. Therefore, MNC embeddedness should be strategically integrating local practices and modifying technology to suit with local requirements to increase larger productivity for exportation. Therefore, MNC embeddedness should allow each plant to achieve higher standards. Where technology embeddedness occurs, the critical factor in improving operational processes in the subsidiary is the effectiveness of the network.

In addition, MNC embeddedness should be able to increase local market penetration and internationally. Thus, MNC embeddedness is important because it supports the acquisition of new technological knowledge. If it is accepted that the development of technology is essential to drive economic growth, then it follows that subsidiaries will benefit from technological embeddedness in creating a competitive advantage in terms of productivity and the propensity of export. Also, embeddedness increases information exchange and thereby the level of innovation and consequently market performance. Our argument highlights the importance of the MNC embeddedness in supporting export intensity. Accordingly, I suggest that the MNC embeddedness has a positive moderating effect on the relationship between export intensity and innovation performance. Therefore, this leads up to present the following hypothesis:

- Hypothesis 1. For MNCs firms, export intensity is positively related to innovation performance.
- Hypothesis 2. For MNCs firms, MNC embeddedness is positively related to innovation performance.
- Hypothesis 3. For MNCs firms, MNC embeddedness positively moderates the effect of the export intensity on innovation performance.

2.2. Moderating Effect of MNC Presence

One way for an MNC to enter a foreign market is by creating plants in upstream industries to generate direct inputs, or in downstream industries where they will produce the finished products. Either approach will have the likely consequence of crowding out the domestic competition, while also creating links in both directions which can benefit local companies (Saliola and Zanfei, 2009).

A number of reports have demonstrated that there are certain benefits for local companies even when MNCs obtain their inputs from developed economies (Saliola and Zanfei, 2009). Some studies have also noted the significance of such factors as the competencies of the companies along with their capacity to absorb the spillovers which might flow towards the foreign economy. Earlier research has established that the likelihood of positive spillovers is increased when capable subsidiaries are linked to MNCs which are innovative and productive in terms of the latest technological advances. However, for spillovers to arise naturally as a result of the presence of MNCs in a particular market, a number of other conditions must also be fulfilled depending upon the attributes of the companies and industry involved (Zanfei, 2004).

It is thus possible that the presence of MNCs creates knowledge spillover which benefits the local subsidiaries. It is also likely to generate knowledge exchange within and between MNCs in the fields of research and development, design and human resources, as the MNCs develop and adopt the knowledge which will allow them to thrive in the local context. In particular, the knowledge and resources provided by the local subsidiaries are vital in generating a competitive advantage since this knowledge is not duplicated and is thus unique to its context. When companies are acquired by MNCs, the MNC network is likely to receive a valuable pool of knowledge which can be especially useful both in the local context and across the wider network.

In addition, MNC presence should be able to increase local market penetration and internationally. Thus, MNC presence is decisive for its ability to transfer knowledge. The effect of presence of MNC may depend on both intentional and unintentional transfers of knowledge to local subsidiaries from MNCs. If I also assume that competitive advantage can be created as a result of knowledge, then any acquisition of knowledge by the subsidiary will result in improved performance in terms of productivity and the propensity of export. Our argument highlights the importance of the MNC presence in supporting export intensity. Accordingly, I suggest that the MNC presence has a positive moderating effect on the relationship between export intensity and innovation performance. Therefore, this leads up to present the following hypothesis:

- Hypothesis 4. For MNCs firms, presence of MNC is positively related to innovation performance.
- Hypothesis 5. For MNCs firms, MNC presence positively moderates the effect of the export intensity on innovation performance.

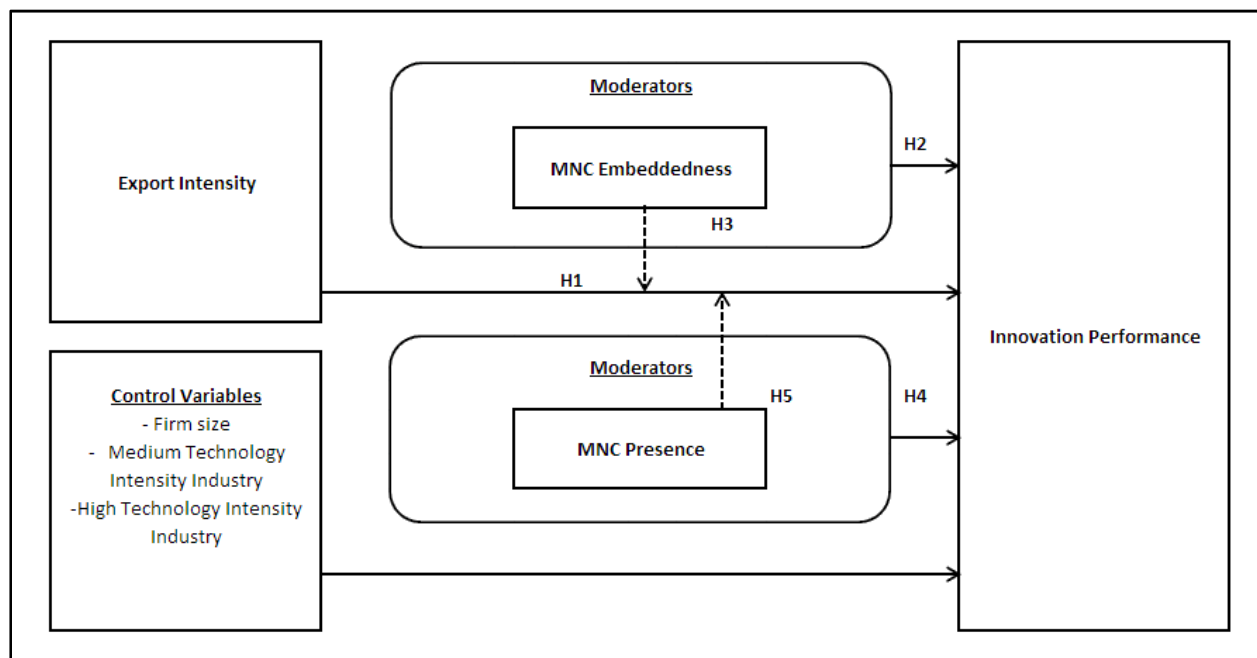


Figure 1: Research framework

3. Research Methodology

3.1. Samples and Sources

This study utilizes company level data from Thailand, obtained from the “Productivity and Investment Climate Survey” (PICS), carried out by the Thai government in collaboration with the World Bank. The participating companies were drawn from the following industry sectors: clothing and textiles, furniture products, food processing, auto parts, electronics, machinery and equipment, plastics and rubber. This research uses firm level data come from a sample of 154 multinational companies in Thailand in 2007. Thai firms are collected in the following industries: Processing Food, Textile, Garment, Auto Parts, Electronics, Electrical Appliances, Rubber and Plastic, Furniture, Machinery and Equipment. The regions where surveyed firms locate covered are seven areas as following: North, Central, Bangkok and Vicinity, East, Upper North-East, Lower North-East and South. I used the STATA 12 program to run the regression results and analyze the results from those sample data. The correlation and regression analysis were analyzed to measure the results of the relationship between R&D intensity, export intensity, number of competitors and innovative capabilities of Thai firms.

3.2 Variable description

3.2.1. Dependent Variable

Dependent variable is innovative performance. Based on the previous studies, this study was measured innovation performance by three items what adapted from Chen et al. (2011) and Zhang and Li (2010), three items are follow; number of new product; the ratio of new products sales to total sales and the speed of new product development.

3.2.2. Independent Variable

Export intensity is employed as an independent variable. I used the variable of export intensity to test its effect on a firm’s innovation performance. This variable can measure by the exports of the enterprise as a ratio of sales.

3.2.3. Control Variables

For control variables, I include *firm size* in this study regarding previous studies investigating the determinant factors affecting firm performance (Hsu, Lien et al. 2015), measured by using the natural logarithm for the number of total. Besides, I used *Industry* based on the Oslo Manual’s guidelines (OECD, 1992) to classify manufacturing industries by technological intensity to calculate this measure. *The first dummy variable* includes medium technological intensity such as chemicals, machinery and equipment, motor vehicles, electrical equipment, medical and dental instruments and supplies, plastic products, on-metallic mineral products and basic metals. *The second dummy variable* includes high technological intensity industries such as pharmaceuticals, computer, electronic and optical product, air and spacecraft and related machinery. Firm of other industries, for instance food product, beverages, textiles, wood and product of wood, printing and paper product, furniture, were set as the benchmark group as low technological intensity industry. I include these four control variables in this model to measure the effect of export intensity on innovation performance.

3.2.4. Moderating Variables

Multinational embeddedness is a concept which encompasses a number of observable variables. Embeddedness can refer to the length of time the subsidiary has operated in Thailand. This approach was taken by Zanfei (2004) and gives consideration to the longevity of foreign businesses with a specific market.

Multinational presence is a second moderating variables in this study. Presence can be calculated to denote the presence of MNCs. The main is the foreign presence ratio which represents the proportion of workers in a given industry sector who are employed by foreign subsidiaries.

4. Data Analysis and Results

According to, I have mentioned above that I collected each variable in 2007 based on “Productivity and Investment Climate Survey” (PICS), carried out by the Thai government in collaboration with the World Bank, here I can see that I have total 154 observations meaning that multinational companies in Thailand. In this summary table, there are mean value, standard deviation value, and variable correlations.

Variables	Mean	Std.dev	1	2	3	4	5	6	7
1. Innovation performance	2.4545	1.0039	1						
2. Export intensity	2.7597	1.7566	0.0855	1					
3. Firm size	2.4817	0.5292	0.1604**	0.3081***	1				
4. Medium technology intensity	0.5649	0.4974	-0.0333	-0.2885***	-0.2135***	1			
5. High technology intensity	0.1429	0.3511	0.0185	0.1078	0.2083***	-0.4652***	1		
6. MNC Embeddedness	1.0871	0.2621	0.0857	0.2785***	0.387***	-0.1134	-0.0026	1	
7. MNC Presence	6.5821	17.0249	0.0188	0.0969	0.4081***	-0.2441***	0.2811***	0.1427	1

Table 1: Means, standard deviations and variables correlations
Significance level: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The summary table 1 present means, standard deviations, min and max value of independent variable and control variables. of innovation performance as dependent variable, export intensity as independent variable, control variables and also include moderating variables (MNC embeddedness and MNC presence).

4.1. Regression Model Analysis

In this part, the empirical study from regression analysis model are shown, as the objectives of this research proposal, in order to study the importance of exportation factors and control variables as firm size and industry intensity to innovation performance. The 154 sample data in years 2007 had been collected by The Foundation for the Thailand Productivity institute (FTPI) and World Bank, then using the STATA 12 program to run the regression result and analyze the results from those sample data.

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Export intensity	0.001	0.001	0.026***	0.001	0.001	0.026***
Firm size	0.288*	0.275	0.244	0.359**	0.362	0.319*
Medium-technology intensity	0.007	0.009	-0.095	-0.015	-0.017	-0.126
High-technology intensity	0.045	0.039	0.071	0.001	0.019	0.003
MNC Embeddedness		0.075	1.499***			1.591***
MNC Presence				0.006	0.015	0.018*
Export Intensity × Embeddedness			0.525***			0.547***
Export Intensity × Presence					0.003	0.004
Constant(β_0)	1.697***	1.650***	0.817	1.573***	1.607***	0.654
F-Value	1.05	0.85	2.75	1.09	1.12	2.55
ModelR ²	0.0275	0.0178	0.0643	0.0355	0.0438	0.0751

Significance level: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 2

4.2. Discussion

The results show in Model 1 to Model 6. The results in Model 1 to Model 6 show that the export intensity is positively related to innovation performance especially in Model 3 and Model 6 when firms have the embeddedness of MNC then export intensity is positively related to innovation performance with highly significant. Therefore, from result I accepted Hypothesis 1.

The coefficient between MNC embeddedness and innovation performance showed in Model 2, Model 3 and Model 6 is all positive relationship. I can interpret that the interaction term between export intensity and MNC embeddedness-technology adaption is positive relationship (Model 2: $\beta = 0.075$, $p > 0.1$; Model 3: $\beta = 1.499$, $p < 0.01$; Model 6: $\beta = 1.591$, $p < 0.01$). According to Hypothesis 2 indicated that MNC embeddedness is positively related to innovation performance so Hypothesis 2 receives support.

The coefficient of the interaction term between export intensity and MNC embeddedness-technology adaption is positive with p-value <0.01 in Model 3 and Model 6 (Model 3: $\beta = 0.525$, $p < 0.01$; Model 6: $\beta = 0.547$, $p < 0.01$). so I can interpret that the interaction term between export intensity and MNC embeddedness is positive relationship with significant. According to Hypothesis 3 indicated that MNC embeddedness positively moderates the effect of the export intensity on innovation performance thus Hypothesis 2 receives support.

The results in Model 4, Model 5 and Model 6 show that the coefficient between MNC presence and innovation performance. The results show MNC presence is positively related to innovation performance (Model 4: $\beta = 0.006$, $p > 0.1$; Model 5: $\beta = 0.015$, $p > 0.1$; Model 6: $\beta = 0.018$, $p < 0.1$). According to Hypothesis 4 indicated that MNC presence is positively related to innovation performance so Hypothesis 4 receives support.

The coefficient of the interaction term between export intensity and MNC presence is positive; p-value > 0.1 in Model 5 and Model 6 (Model 5: $\beta = 0.003$, $p > 0.1$; Model 6: $\beta = 0.004$, $p > 0.1$). Therefore, I can interpret for MNC firms with high presence of MNC, export intensity has a positive relationship with innovation performance. According to Hypothesis 5 indicated that MNC presence positively moderates the effect of the export intensity on innovation performance. Consequently, Hypothesis 5 receives support.

5. Conclusion

The objective of this study is to develop the understanding for how the MNCs knowledge is implemented in the local subsidiaries. The embeddedness and presence of MNC are the method that MNCs use for transfer knowledge and technological capability. Furthermore, I would like to improve understanding about the actual practice of innovation performance at firm level in MNCs in Thailand from our result show that MNCs firm in high-technology intensity firm have a greater innovation performance than other types of technology intensity. Besides, firm size also concern innovation performance because might be hard for small and medium firm or new firm of MNC to develop product or process innovation because it requires large and superior resources which these firms lack of these resources.

The next objective of the study is to investigate the relationship between export intensity and innovation performance implementation in MNCs in Thailand. Our finding shows that the export intensity is positive relationship with innovation performance with significantly when firms have embeddedness (longevity of foreign businesses with a specific market). My research also suggests that export intensity can be good for innovation performance when the embeddedness of MNC is high as MNCs embeddedness refers to the length of time of investment by foreign subsidiaries. The findings of this study provide a support resource-based view theory (RBV) that internal resources are required for increase exportation and developing innovation. Necessary resources for increase productivity and exportation are vision, technological proficiency, launch proficiency, and human capital. This study indicates that RBV can be applied in emerging market such as Thailand (AtuaheneGima, 2005).

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