

Roles of information and communication technology on export competitiveness of Thai small and medium-sized enterprises

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ABSTRACT

This research analyzes the role of information and communication technology on export competitiveness of Thai small and medium-sized enterprises. It studies the effects of the relative uses of information and communication technologies on relative competitiveness, measured by relative market share of exports to the world, compared between Thailand and other countries in ASEAN except Singapore. Singapore is excluded from the study because it is a re-exporting country rather than a producing country. The result reveals that the relative uses of mobile phones and broad-band internet are positively affect the relative market share of exports to the world markets. However, the relative use of fixed telephone is insignificant to the improvement of the relative competitiveness.

Keywords: Information and communication technology, competitiveness, exports, relative market share, small and medium sized enterprises,

JEL Classification: F14, L96, L25

1. Introduction

The reason why government agencies focus on export competitiveness is that export is a crucial source of revenue for the economy. Mostly exports will be accounted on the activities of small and medium-sized enterprises (SMEs). Applying the information and communication technologies to the operation of SMEs, entrepreneurs hope to gain more export competitiveness. With the growing export sector which will lead to economic growth in Greater Mekong Sub-region countries (Zhang, 2012), a nation in ASEAN might also expect the impact on the income distribution which later will be a powerful tool to alleviate poverty in the country (Techanan and Suriya, 2012). This study focuses on the benefits of using information and communication technology on developing competitiveness for SMEs in Thailand.

2. Theory

2.1. Competitive strategy

Competitive strategy is discovered by Michael E. Porter. It describes a competitive ability as a function of resources management that plays a critical role in helping business optimize the core resources.

1) Michael E. Porter discovered the five forces model well known for his a simple identification of five generic descriptions of industries as follows: Existing competitive rivalry between suppliers, Threat of new market entrants, bargaining power of buyers, Power of suppliers, Threat of substitute products (including technology change). These factors are what business must experience in order to succeed. Therefore, business should learn to implement these factors so as to prepare for what they will need in order to become competitive.

2) Competitive Advantage theory, another theory created by Michael E. Porter states that a business may be able to sustain a competitive advantage based on cost leadership, differentiation and focus so that it will be creating a competitive advantage over its competitors.

2.2. Competitive advantage concept by the World Economic Forum

The World Economic Forum (WEF) defines the concept of competitive advantage as "the effectiveness of competitive advantage strongly depends on various factors - including the domestic economy and fiscal policies or even social factors, etc." WEF also identifies three significant influence factors for competitive ability in each country: basic requirement, efficiency enhancers, and innovation and sophistication factors.

2.3. Competitiveness ability concept by the IMD

International Institute for management Development (IMD) defines national economic competitiveness as the ability of the nation to create and maintain an environment that sustains more value creation to enhance those businesses' ability to compete within their

own countries and internationally. A definition of IMD, additionally, will be more focused on the structural factors.

2.4. Competitiveness concept by Paul Krugman

In Paul Krugman's view on competitiveness, the obsession of business competitiveness is not only wrong but also dangerous, skewing domestic policies and threatening the international economic system. The best way, therefore, is to implement collaboration.

2.5. Competitiveness ability Theory by Mcfetridge

The theory focuses on competitive ability of companies. It mentions that competitive ability of companies can be described obviously when a company can make the most profit in the market. This meaning can be explained best as "competitive ability".

3. Literature review

3.1. The analysis of competitiveness Models

Evangelos Ioannidis and Paul Schreyer (1997) studied the estimation of factors that determine the proportion of the market share in the industry by using Model Market Share. Moreover, Gary Madden, Scott J. Savage and Su Yin Thong (1997) adopted the Model of Export Market Share (MSX) for estimation. The result concluded that a price competition is a critical variable in international trade. Moreover, there was a non-price competition, namely, technology, as well as the investment. Suriya and Wiboonchutikula (2000) studied the reduction of Thailand's export demand and output and also the causes of export's reduction by using the Model of Export Market Share Analysis. Keld Laursen and Valentina Meliciani (2010) analyzed the ability to maintain market share with a Model of Export Market Share and found that information communication and technologies in both domestic and international all positively correlated with the market share of exports.

3.2. Improving Competitiveness Strategies

Sanjaya Lall (2001) analyzed the economic characteristics of developing countries to be used as a measure of competitiveness. Office of National Economic and Social Development Board (2545) shown the conditions of globalization and its impact on the country and also guidance in the development of Thailand's competitiveness ability. Additionally, Junaidah Hashim (2007) proposed the usefulness of Information and communication technologies with small and medium sized enterprises. The result has concluded that the applications of information technology to SMEs enterprises are still in a low level duo to its complexity of the technology. Steve Esselaar and Christoph Stork, Ali Ndiwalana and Mariama Deen-Swarray (2007) suggested that Information technology is crucial to forecasting the economic development, poverty reduction, and employment rate in developing countries.

4. Methodology

This study studies the effect of the relative uses of information communication and technologies on the relative export competitiveness of Thai small and medium sized enterprises compared to other ASEAN countries. Competitiveness is measured by relative market share (RMS). The determinants of the relative competitiveness are specified in a model modified from the model of Magnier and Toujas-Bernate (1994) as follows:

$$RMS_{it} = \alpha + \beta_1 DA_{it} + \beta_2 VA_{it} + \beta_3 TEL_{it} + \beta_4 MOB_{it} + \beta_5 INT_{it} + e_{it}$$

Where	RMS	is	Relative Market Share
	DA	is	Relative development aids received by the country
	VA	is	Relative Value Added at market price
	TEL	is	Relative number of the uses of fixed phones
	MOB	is	Relative number of the uses of mobile phones
	INT	is	Relative number of the uses of broad-band internet
	i	is	number of countries in ASEAN (except Singapore)
	t	is	Time
	α, β	is	Estimated parameters

For the estimation, this research uses Random Effect Model and the Fixed Effect Model. Hausman test is decided whether the Random Effect Model or the Fixed Effect Model is more appropriate to the data.

5. Data

The study uses the secondary data from the Statistic Yearbooks of ASEAN countries during 2007 – 2009 to construct a panel data set. ASEAN countries included in this study are Thailand, Malaysia, Indonesia, Vietnam, the Philippines, Cambodia, Lao PDR and Myanmar. It leaves Singapore because the country is specialized in re-exporting rather than producing export goods. It also leaves Brunei because of the incomplete data on market share to the world market. The study tries to include data from 2003 to 2009 but unfortunately the data from 2003 to 2006 are incomplete in some variables. Therefore, the whole complete data set covers from 2007 to 2009.

6. Results

The Hausman test shows that Fixed Effect Model is better than Random Effect Model (Table 3). According to the Fixed Effect Model in table 2, there are several factors affecting the relative export competitiveness. They include relative number of the uses of mobile phones and relative number of the uses of broad-band internet. These results support the positive roles of information and communication technology on the development of relative export competitiveness.

Table 1. Results of the Fixed Effect Model.

Dependent variable: Relative market share of the exports to the world market.					
Independent variables	Independent variables	Independent variables	Independent variables	Independent variables	Independent variables
Development aids	.247086	.4097718	0.60	0.561	-.6798822 1.174054
Vale added at market price	-.7827524	4.599221	-0.17	0.869	-11.18691 9.612407
Number of the uses of mobile phones	.9287501	.1313409	7.07	0.000	.6316364 1.225864
Number of the uses of fixed phones	-.0677584	.0925676	-0.73	0.483	-.2771608 .141644
Number of the uses of broad-band internet	2.683797	.3731162	7.19	0.00	1.83975 3.527845
Constant	-58.74812	15.44455	-3.08	0.004	-93.68613 -23.81011
sigma_u	179.1956				
sigma_e	3.567461				
rho	.99960382 (fraction of variance due to u_i)				

Source: Estimation using Stata version 9.1

Table 2. Results of the Random Effect Model.

Dependent variable: Relative market share of the exports to the world market.					
Independent variables	Coefficients	Standard errors	z	P> z	95% confidence intervals
Development aids	.0505976	1.592007	0.03	0.975	-3.069679 3.170874
Vale added at market price	-2.139994	3.359841	-0.64	0.524	-8.725162 4.445173
Number of the uses of mobile phones	.09116	.1843667	0.49	0.621	-.2701922 .4525122
Number of the uses of fixed phones	.287229	.2153949	1.33	0.182	-.1349373 .7093953
Number of the uses of broad-band internet	-.1150827	.351339	-0.33	0.743	-.8036945 .5735291
Constant	27.0922	20.73521	1.31	0.191	-13.54806 67.73246
sigma_u	8.4797889				
sigma_e	3.567461				
rho	.84962499 (fraction of variance due to u_i)				

Source: Estimation using Stata version 9.1

Table 3. Results of the Hausman Test.

	Coefficient from Fixed Effect Model	Coefficient from Random Effect Model	Differentiation Value	Standard Deviation
Development aids	.247086	.0505976	.1964884	.
Vale added at market price	-.7827524	-2.139994	1.357242	3.140748
Number of the uses of mobile phones	.9287501	.09116	.8375901	.
Number of the uses of fixed phones	-.0677584	.287229	-.3549874	.
Number of the uses of broad-band internet	2.2683797	-.1150827	2.79888	.1256049
chi ² (5) = 114.58				
Prob > chi ² = 0.0000				

Source: Estimation using Stata version 9.1

Note: Ho: Random Effect Model is better than Fixed Effect Model
 H1: Fixed Effect Model is better than Random Effect Model

7. Conclusions

In the era of rising information and communication technology (ICT), this study figures out that the investment of ICT is worth for developing countries. It shows that the uses of mobile phones and broad-band internet can enhance the export competitiveness of nations. This study uses relative market share to measure the relative competitiveness. It constructs the relative market share model followed the concept of Magnier and Toujas-Bernate (1984). It estimates the model by Fixed Effect Model and Random Effect Model. Later the Hausman test shows that the results from the Fixed Effect Model is better. The results from the Fixed Effect Model can be interpreted that the relative use of mobile phones and the relative use of broad-band internet help to boost the relative market share. However, the relative use of fixed phones is not significant to the enhancement of the export competitiveness. This study, therefore, support further development and investment in ICT infrastructures as well as ICT applications in order to strengthen the nations' export competitiveness.

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