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Measuring Border Trade Competitiveness of Thailand: Application o Refined Index on Revealed Comparative Advantage (RCA)

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Abstract

The opened economy and economic policy in Greater Mekong Sub region (GMS) will attract trade and investment from other countries. In addition, GMS is member of FTAs, which is the channel to support exports and trade privileges of developing countries. However,there are differences in some aspects among GMS countries: in administration, geography and economic potentials. These should be considered as crucial factors to drive the GMS economy. Therefore, there is the need to study the competitive advantages to develop cross border trades of Thailand policy in GMS. This study applies revealed comparative advantage (RCA) index formula based on these crucial factors to analyze competitive advantages. There are three points of conceptions. Firstly, Trade Balance Index (TBI) can indicate clearly whether the country is a net-exporter or the net-importer product group in five industriesbeing considered . Secondly, the trade balance is usually decomposed by product and by country (bilateral trade balances). Relevance is the degree of concentration on imbalance trade caused by one or few commodities. The long-term trends of trade imbalances are ***widespread*** *throughout the world and* ***persisten*** *over time, thus it requires an appropriate dynamic method to measure Revealed Trade Balance Comparative Advantages (DRTCA). Thirdly, the Gravity Trade Model and Panel Data Analysis can be utilized to estimate export value (Adams et. al, 2003). The model takes into agent toward input variable of potential effects and geographical effects. The results of DRTCA provide the analysis of different aspects in geographic and economic potentials among GMS countries. This study may contribute crucial insights to Thailand developing economic policies on cross border trade.*

Keywords: *GMS, RCA, DRTCA, Trade Balance Index, Panel Data Analysis*

1.0 Introduction

Improving value of exports is the primary goal of Thailand international trade policy. The forming cooperation in ASEAN Economic Community is an effective strategy to gain more advantages from regional market integration. Thailand is looking for opportunities and taking advantages of trade agreements, such as networking and partnership with neighboring countries. Currently, Thailand trade with Greater Mekong Sub region (GMS) neighboring countries, plays more important role as globalization, brings about more faster and more convenient trading and investing. Each country tries to find new export market to scatter domestic risk of concentration as much as the case of economic recession faced by major areas of many developed countries, like USA, Japan, China, and member countries of EU. Thailand has to adjust by searching new market in order to increase investment and to stimulate economy. Furthermore , the GMS market can be source of productions and channel for product distributions.

Recently, Thai government is very interested in its border market, where the value of Thai border market grows continuously. There are five countries adjacent to Thailand, divided by the Mekong River such as Lao, Cambodia, Vietnam, Myanmar, and China. Trade value in GMS has highly expanded because of the opened economy and economic policy. These will attract trade and investment from other countries. In addition, GMS is member of Free Trade Agreements (FTAs), which is channel to support exports and trade privileges of developing countries. However, there are some differences in perspective among GMS countries and management of geography and economic potentials. Thissupposition has been considered existentially as the key factor in the Mekong Regions economy. With the geographical features that bring about similarities in ethnics, religions, and cultures. The significance of enormous annual value trade of Thailand with neighboring countries in GMS has been very promising tendency of the huge increasing in the future. Thus, Thailand should be considered as the benefits and the differences in some aspects among GMS countries to drive GMS economy in order to focus on exactly direction to the competitive GMS market.

This study aims to answer the following questions: Which is the most dynamic market for Thailand exports? How intense is Thailandtrade with its (regional) trading partners? Will the modification of Revealed Comparative Advantage index (RCA) developed from the gravity model be applied to measure Thailand competitiveness results from its border trade policy? Application of the RCA index formula is usually associated with three points of conception: *Firstly*, Trade Balance Index (TBI) can indicate clearly whether the country as net-exporter or net-importer of GMS country. *Secondly*, the trade balance is usually decomposed by product and by country (bilateral trade balances). Relevance is the degree of concentration of imbalance trade caused by one or few commodities (Piana, 2006). The Long-term trends of trade imbalances are **widespread** throughout the world and **persistent** over time. Thus, it requires an appropriated dynamic method to measure Revealed Trade Balance Comparative Advantage (DRTCA). *Thirdly*, the Gravity Trade Model and Panel Data Analysis can be utilized for estimating the export value (Adams et. al., 2003).

The potential effects such as exchange rate, GDP, Tariffs, trade barriers, PTA, FDI and geographical effects will be included in the model important variables. Analysis based on estimated results of DRTCA would provide us the different aspects in geographic and economic potentials among GMS countries. This study may contribute crucial insights in examining Thailand economic policies on cross border trade.

2.0 Literature Reviews

2.1 Modification RCA Index

The most popular RCA index was Balassa's RCA index (Balassa, 1965). While Balassa's RCA index was useful in assessment whether or not the country had comparative advantage in the commodity, its utilities in comparative studies were limited and problematic (Hillman, 1980; Bowen 1983; 1985; 1986; Balance, et al. 1985; 1986, Deardorff, 1994; Hoen and Oosterhaven, 2006; Run Yu, et al., 2008). Most studies used Balassa's RCA index only to signify the country relative ranking of comparative advantages in different commodities, eventhough this relative order in general remained problematic (Yeats, 1985). Because the RCA index was not a perfect index and had the following shortcomings. Deardorffs (1980) theory resulted that this

observation was "on average" indication of "true" comparative advantages. Furthermore, they found empirically that such indices were were more consistent among themselves and with other indices than any of the alternative RCA measurement. They found little support for RCA indices, based on only one side of the market, as demand indices . For comment added in the use and spread of technology, in their employment contents , in the capacity to foster economic growths, etc. In particular, on the relationships between trade and technological specialization, Uchida and Cook (2005) found that the patterns of specialization had been transformed by both activities of multinational corporations, and through the influence of progressive government policies which aimed to the improving competitiveness, the number of patents, export values, corresponding TCA and RCA indics themselves could not fully capture such influences.

Chien (2010) suggested, conducting advantage of RCA value to take each country's economic scale into account for each export industry market share that enabled the use of the same index to represent comparative competitiveness of the same product between each country or of the different products in the same country. For the new knowledge about improving RCA measurement were found from Balance, et.al (2012), the results would support two approaches. Firstly, researchers might modify their empirical models to incorporate ordinal (or dichotomous) measurement of RCA. The much higher degree of consistency among alternative measurement should significantly reduce the sensitivity of empirical results to the particular RCA index chosen. Secondly, researchers could apply an RCA measurement based upon net exports (appropriately normalized for product significance and country size).

2.2 The Gravity Model

Anderson (1979) made the initial formal endeavor deriving Gravity Model of bilateral trade based on product differentiation. Anderson and Wincoop (2003) argued that the major feature of the Gravity Model of Bilateral Trade was the dependence of trade flowing on trade resistance factor. Furthermore, they proved the strength of the theoretical foundation of gravity model of Bilateral Trade. Thus, the subsequent step was needed in order to link the characteristics of the Balassa index *(BI)* distribution as the one we have just discussed to other macroeconomic aspects of the economy that researcher was interested in analyzing (De Benedictis and Tamberi, 2004). In terms of data, for measurement of comparative advantage, we applythe method from Adams et. al., (2003), in which their studies emphasized in three mutually related causal factors: (1) Geography (2) Openness to international trade as a channel of technology diffusion, gaining through exchange and specialization (3) The rules and norms prevailing in society that shaping an individual's productive behavior. These three determinants ultimately exerted the fundamental influence on the well-known channels that promoted economic growths.

3.0 Empirical Study

3.1 Refinement of RCA

The Revealed Comparative Advantage (RCA) Index include three points of conception. *Firstly*, from the based macroeconomic theory identity Y=C+I+G+(X-M), where Y, C, I, G, X and M are outputs, consumptions, investments, government expenditures, exports and imports respectively. It is clearly shown that trade-balance (X-M) is one of the sources of output growth (Y). From

this point of conception, the higher share of specific product on total domestic exports increases, the more significant of exported product contribution to domestic economy becomes.

The Trade Balance Index can indicate (TBI) clearly whether the country as thenet-exporter or the net-importer. TBI (Lafay, 1992) is employed to analyze whether the country has specialization in export (as a net - exporter) or in import (as a net - importer) for GMS country. TBI is simply formulated as following

$$TBI_{ij}^{p} = (X_{ij}^{p} - M_{ij}^{p}) \Big/ (X_{ij}^{p} + M_{ij}^{p}) \quad (1)$$

Where

TBI_{ij} Denoted trade balance index of country i and country j in product (p);

X_{ij}^{p} and M_{ij}^{p} represent value of exports and imports from country *i* to country *j* in product *p*, respectively. Values of index range from -1 to +1. Extremely, TBI equals to -1 if country only imports in product *p*, in contrast, the TBI equals to +1 if the country only exports in product *p*. The country is referred to "net-importer" in the group of product in GMS country where the value of TBI is negative, and "net-exporter", where the value of TBI is positive. *Secondly*, the Trade Balance is usually decomposed by product and by country (bilateral trade balances). The relevance in the degree of concentration on imbalance trade is caused by one or few commodities. If the concentration is high, the targeted industrial policy could improve the balance (e.g. reduce the imbalance). On the other hand, if the deficit is due only to fewer partners and has proactive and consensus-based trade negotiations with them, then it could fairly quickly set up the problem. Although it is less general than trade balance, which includes both goods and services, the "**merchandise balance**", would include only goods but not services. It is sometimes used because of better data availability (Piana, 1998). The Revealed Comparative Advantage (RCA) index from above two problems are applied as follows.

3.1.1 Standard Balassa's RCA index

$$RCA_{ij}^{p} = \frac{\left(\frac{X_{ij}^{p}}{\sum_{p} X_{ij}^{p}} \right)}{\left(\frac{X_{g}^{p}}{\sum_{p} X_{g}^{p}} \right)} \quad (2)$$

where

X_{ij}^{p} Representsvalue of export products *p* from country *i* to country *j*;

X_{g}^{p} Represents value of export products *p* from set of countries considered in the analysis *g*, not include country *i*.

$RCA_{ij} \rangle 1$ Indicates country *i* has comparative advantage in product *p*; the greater index, country *i* has the stronger advantage than country *j*.

$RCA_{ij}\langle 1$ Indicates country *i* has comparative disadvantage in product *p*; the smaller index, country *j* has the stronger advantage than country *i*.

3.1.2 Revealed Trade Balance Comparative Advantage (RTCA) Index

Instead of introducing X_{ij}^{p} in equation (1) of standard Balassa's RCA formula, we can get the RTCA index as follows

$$RTCA_{ij}^{p} = \left(\frac{(X-M)_{ij}^{p} \Big/ (X+M)_{ij}^{p}}{(X-M)_{g}^{p} \Big/ (X+M)_{g}^{p}} \right) \times \left(\frac{\sum_{p} \left((X-M)_{g}^{p} \Big/ (X+M)_{g}^{p} \right)}{\sum_{p} \left((X-M)_{ij}^{p} \Big/ (X+M)_{ij}^{p} \right)} \right) \quad (3)$$

where

X_{ij}^{p} And M_{ij}^{p} are the value of exports and imports product *p* from country *i* to country *j;*

X_{g}^{p} and M_{g}^{p} are the value of exports and imports product *p* from set of countries considered in the analysis *g*, not include country *i*.

The definition of RTCA index is the same as on RCA index with value of $RCA \in [-\infty, +\infty]$. The country is referred to "net-importer" in the group of product of GMS country if the value of RTCA is negative, and "net-exporter" if the value of RTCA is positive. From the long-term trends, trade imbalances are **widespread** throughout the world and **persistent** over time. For business cycle behaviors, trade balance tends to be strongly **anti-cyclical**: in boom periods, it usually exhibits deficits, whereas in the recessions trade surplus can help inverting the business cycle (Piana, 1998)

3.1.3 The Dynamic of Revealed Trade Balance Comparative Advantage (DRTCA) Index

$$DRTCA_{ijt}^{p} = \left(\frac{(X-M)_{ijt}^{p} \Big/ (X+M)_{ijt}^{p}}{(X-M)_{gt}^{p} \Big/ (X+M)_{gt}^{p}} \right) \times \left(\frac{\sum_{p=1}^{m} \left((X-M)_{gt}^{p} \Big/ (X+M)_{gt}^{p} \right)}{\sum_{p=1}^{m} \left((X-M)_{ijt}^{p} \Big/ (X+M)_{ijt}^{p} \right)} \right) \quad (4)$$

Thirdly, we use the Gravity Trade Model and Panel Data Analysis to calculate the export value (Adams et. al, 2003). The model takes into agent, to input variable of potential effects and geographical effects, the issues conducts to exchange rates, GDP, FDI, Tariffs, trade barriers, PTA and geographical effects. So, we have points of concept, finding new of export and import value from the multiple regression function by panel analysis.

3.1.4 Improve Gravity Model from Limitation of RCA Index

The basic functional form of the Gravity Model of bilateral trade is as following:

$$X_{ij} = \frac{kY_{i}^{\alpha}Y_{j}^{\beta}}{D_{ij}^{\gamma}} \quad (5)$$

where

X_{ij} is bilateral trade flows (usually exports)

Y_i is GDP of country *i* (exporter to country *j*)

Y_j is GDP of country *j* (importer from country *i*)

D_{ij} is Distance between country *i* and *j*

The stochastic log-linear version of the basic Gravity Model of bilateral trade is as following :

$$\log X_{ij} = \log k + \alpha \log Y_i + \beta \log Y_j - \gamma \log D_{ij} + \varepsilon_{ij} \quad (6)$$

Jordaan and Kanda (2011) added a vector of dummy variables in Gravity Model, with a set of dummies, which can also be added in specification of model to account for factors enhancing or restraining the trade flow.

$$\log X_{ij} = \log k + \alpha \log Y_i + \beta \log Y_j - \gamma \log D_{ij} + \sum \phi A_{ij} + \varepsilon_{ij} \quad (7)$$

A_{ij} is the dummy function

In this study, we would improve A_{ij} function from Adams et.al (2003) for more enhancing solving differences on some aspects among GMS countries: administration, geography and economic potential. So, the dummy function in this study is as following:

$$A_{ij} = f(lin^{\beta_1}, Bor^{\beta_2}, PTA_{ij}^{\gamma_1}, PTA_i^{\gamma_2})$$

Log - linear version for estimating export and import value is:

$$\log(X)_{ijt}^{p} = \alpha_0 + \alpha_1 \log GDP_{it} + \alpha_2 \log GDP_{jt} + \alpha_3 D_{ij} + \alpha_4 \log rer_{ijt} + \alpha_5 \log FDI_{it} + \alpha_6 \log FDI_{jt}$$
$$+\alpha_7 \log POP_{it} + \alpha_8 \log POP_{jt} + \alpha_8 \log tar_{ijt} + + \beta_1 lin_{ij} + \beta_2 Bor_{ij} + \gamma_1 PTA_{ij} + \gamma_2 PTA_i + \nu_{ij} \quad (8)$$

where:

$(X)_{ijt}^{p}$ is the export value of product p from country *i* to country *j* in year *t;*

GDP_{it} is the GDP (economic mass of country *i* (reporter) in year *t*;

GDP_{jt} is the GDP (economic mass of country *j* (partner) in year *t*;

Dij is the distance between the two largest or capital cities of countries *i* and *j* ;

rerijt is the bilateral real exchange rate between *i* and *j* in year *t;*

tarijt is the average tariff rate in importing country *j* on goods from country *i* in year *t* ;

linij is the dummy that takes value 1 if *i* and *j* linguistic similarity between *i* and *j* and 0 otherwise;

Borij is the dummy that takes value 1 if *i* and *j* share land border and 0 otherwise;

PTA_{ij} is the dummy that take value 1 if i and j both belong to the same preferential trade agreement and 0 otherwise;

PTA_i is the dummy that take value 1 if only i is member of preferential trade agreement and 0 otherwise;

$FDI_{i,t+i}$ is the stock of FDI (in 2000 US dollars) in country *i*;

$FDI_{j,j+i}$ is the stock of FDI (in 2000 US dollars) in country *i*;

POP_{it} is the number of population of country i in year t;

POP_{jt} is the number of population of country j in year t;

ε_{ijt} is an error term.

3.1.5 Expected Signs

The relationship between exports and imports with both GDP measurement is expected to be positive. Thehigher GDP in Thailand with higher production capacity, in turn transformed into the ability of Thailand economy to export more (supply side). On the other hand, the higher GDP for trading partner country means, the higher absorption capacity, i.e. the trading partner country is able to import more (demand side) (Jordaan and Kanda, (2011). According to Martinez-Zarzoso and Nowak-Lehmann (2003), the negative relationship between exports and population is an indication of the absorption effect. This means that the country with the large population would indicate that its domestic market is large enough to 'absorb' the considerable portion of domestically produced goods and thereby to reduce the amount of domestically produced goods that could be exported. Exports and the exchange rate are expected to be positively related as higher rates of exchange, which would mean that it is cheaper for the trading partner country to source the required amount of rounds, to effect payments for imports resulting in higher demand for Thailand exports. The distance is normally expected to be negatively related to the flow of exports, i.e. the higher the distances, the higher the costs involved in trading and therefore the negative effects on the trade flow.

4.0 Estimation

The studies comparative advantage of Thailand border trade has two stages of the estimation of RCA index.

Stage one: Estimation on the Gravity Model from equation (8), to calculate export of the country – pair (Thailand and GMS country). Martinez-Zarzoso and Nowak-Lehmann (2003) indicated that panel data estimation of the Gravity Model of bilateral trade has many advantages over cross-section analysis such as , the role of trading cycle of Thailand and the GMS over long period of time can be appropriated by using Panel Data Analysis. In addition, country-specific effects, do not change over time. Another aspects to be considered in using Panel Data Analysis is the risk of receiving bias estimation is lowered. The Gravity Model of bilateral trade in this study is estimated by Panel Data.

Stage two: Replace export and import value from equation (8) in the Dynamic of Revealed Trade Balance Comparative Advantage (DRTCA) index (equation (4).

4.1. Data Source

The data set in this study comprises of 80 observations, which include 16 annual observations (1995-2010) for five countries, representing GMS country's major trading partners such as Cambodia, Laos, Vietnam, Myanmar and China. The analysis involves with five industries; manufacturing with medium skill and technology intensive, crude rubber, petroleum, plastics in primary form, iron and steel.

Dependent variables are bilateral export and import data, between 1996 and 2010 obtained from WITS database.

Explanatory variables are from World Bank's World Development Indicators database (WDI). The remaining data are from similar Gravity Model studies. The details are as following:

The data on GDP and populations are taken from the World Bank's World Development Indicators (WDI 2005). GDP data measures gross domestic product at Purchasing Power Parity (PPP). The primary sources of distance data, linguistic similarity, are from CEPII2 (2004). Distance between the two largest cities are measured in kilometers. A dummy variable takes value one when the two countries share currency, and zero . Exchange rate data were sourced from WDI (2005). The exchange rate is measured as the average exchange rate — the number of local currency units t can be traded for one US dollar. A bilateral exchange rate (the value of a unit of the exporter's currency in terms of the importer's currency) is calculated by dividing the importers US dollar exchange rate by the exporters US dollar exchange rate.

The tariff data are from the WITS database. The variable is measured as the weighted average tariff rate — total value divided by the number of tariff lines and weighted by trading partners. The source of the Preferential Trade Agreement (PTA) data is from an intra bloc trade of world trade organization. PTA is a dummy variable capturing, whether Thailand and GMS country partner. The FDI stock levels are from OECD Statistics and printed issues of UNCTAD's World Investment Report (WIR).

4.2 Panel Data Analysis

The Gravity Model is used to estimate export value using Panel Data Regression. The individual effects model by fixed coefficients in fixed effects models are treated as random drawing from larger population in random effect model (Baltagi, 2005). For estimation purpose of this study, the estimation of random effects models are taken into account variation between individual as well as variation within individual. For the data set, it is possible to include dummy variables in the model, the dummy variables are constant over time for each individual.

The ability of random effect model are taken into account variation, between individuals as variation. Within individual makes it an attractive alternative to fixed effects estimation. However, for the random effect are estimated to be unbiased in large samples, the effects must be uncorrelated with the explanatory variable. That assumption can be tested using Hausman Test. The Hausman Test is the test of significance of difference between the fixed effects and the random effects estimated . Correlation between random effects and explanatory variables will cause these estimations to diverge; their differences will be significant. If the difference is not significant, there is no evidence of offending correlation; which cannot reject the null hypothesis: $H_0: E[\mu_i | X_{it}] = 0$. The difference between the two sets of estimation can be tested separately using *t-tests,* or as a block using a χ^2 - *test* (Griffiths, et. al, 2008).

5.0 The Results

5.1The Effect of Crucial Variable toward the Export

The results for stage one estimation are reported in Table 1. Estimation of the Gravity Model from equation (8) for estimating export value of country – pair (Thailand and GMS country). The Panel Data estimation of the Gravity Model of bilateral trade with restrictions specifies models contain with effect random effect in the period dimension. For the random effect, estimated to be unbiased and can be tested using Hausman Test. Correlation between the random effects and the explanatory variable are not significant; they are no evidence of the offending correlation; cannot reject the null hypothesis. The results of Gravity Model in five industries, direction of GDP measuring between Thailand and trading partner were different signs in each industry, and most of significant positive effects are on exports. The population has significant positive effect on exports. Jordaan and Kanda (2011) argued that negative relationship between exports and population are an indication of absorption effect. This means that the country with big population would indicate that,domestic market is large enough to absorb considerable share of domestically produced goods and thereby it reduces e the amount of domestically produced goods that could be exported. In this case, increasing in the population size would result in increasing in exports. As priority of expectations, Table 1 also shows that the weaker rank (higher exchange rate) enhances exports from Thailand to its trading partners. The tariff rate has significant negative effect in manufactures with medium skill and technology, and both FDI measurement (for Thailand and the trading partners) have strong significant positive in manufactures with medium skill and technology of Thailand and weakly significant negative effect on crude rubber, iron and steel industry of partner trading.

On the other hand, it was found that the geographic effect to export is in part of manufactures with medium skill and technology intensity, and crude rubber have negative effect with dummy border variable. In this case, increasing in the border size would result in lower exports, due to the fact that Thailand has higher import value than its trading partners (GMS countries) of medium material for producing final product. The distance between capital cities has significant negative effect to export in only crude rubber industry. This could be interpreted as Thailand is being an exporter in crude rubber market with its trading partner and the increasing of the distance between capital cities of Thailand and trading partner would result in the lower exports. Thailand and its trading partners who belong to the same preferential trade agreement, have a significant positive effect in Iron and steel industries and significant was the negative effect. In this case, iron and steel industries are trade diversions.

5.2. The Comparative Advantage of Thailand to the GMS Countries

The result of comparative advantage measurement has aims on support and its database for international trade policy in developed border trade of Thailand. Thus, the dynamics of border trade advantage of the selected five industries can be captured by the estimations of the DRTCA index, as shown in Table 2. In table 2 shows the results of comparative advantage trade and Thailand role in GMS market in each period of five industries.

Table 1: Stage One (Random Effect Model) Regression Results

Variable	and	Manufactures	Crude	Petroleum,	Plastics	in	Iron and steel

Statistics	with medium skill and technology intensity	rubber (including synthetic and reclaimed)	petroleum products and related materials	primary forms	
C	-103.1361	-688.7904	-288.9351	-148.7693	-262.2355
	(-4.3650)***	(-.3.4931)***	(-4.4976)***	(-2.8269)***	(-3.8835)***
BOR_TH	-3.166372	-20.40636	0.409020	1.441437	-1.717601
	(-3.522)***	(-2.8097)***	(0.1468)	(0.7541)	(-1.1151)
DIS_TH	6.17E-06	-0.000740	0.000178	0.000110	7.08E-05
	(0.1573)	(-2.4321)**	(1.2265)	(1.1238)	(1.1846)
LOG(FDII_TH)	0.258955	-1.321331	-0.647996	-0.262200	-0.086494
	(2.0351)**	(-1.1751)	(-1.7654)*	(-0.9811)	(-0.2345)
LOG(FDIJ_TH)	0.156866	-1.813641	-0.245052	0.283037	-0.380781
	(1.3460)	(-1.7287)*	(-0.4722)	(1.1261)	(-1.9022)*
LOG(GDPI_TH)	0.629600	4.553233	-0.432514	-0.218326	0.899560
	(3.791)***	(3.3397)***	(-0.8148)	(0.5209)	(2.7321)***
LOG(GDPJ_TH)	0.095133	-1.778790	1.304723	0.428919	-0.596325
	(0.467)	(-1.0142)	(2.5591)***	(0.8761)	(-1.7202)*
LIN_TH	-0.280683	-1.419153	-0.289973	1.389637	0.266675
	(-1.7823)	(-1.0855)	(-0.6044)	(3.8402)***	(0.9375)
LOG(POPI_TH)	11.30350	62.96065	29.64210	13.83209	24.31081
	(5.1891)***	(3.4193)***	(4.9095)***	(2.9204)***	(3.8275)***
LOG(POPJ_TH)	-1.249086	2.309110	-1.851582	0.447945	0.561248
	(-10.1154)***	(2.2822)**	(-4.2889)***	(1.5178)	(1.8304)*
PTAI_TH	-0.039200	-0.194999	-0.067432	0.260545	-0.322815
	(-0.6756)	(-0.3929)	(-0.4572)	(1.9173)*	(-2.6326)***
PTAIJ_TH	0.042770	-0.100669	0.045705	-0.139840	0.421976
	(0.8029)	(-0.2376)	(0.2787)	(-1.1029)	(3.8910)***
LOG(TAR_TH)	-0.455801	0.211991	-0.474869	-0.548246	-0.381382
	(-6.8651)***	(1.3642)	(0.0253)	(-1.5181)	(1.4435)
LOG(RER_TH)	-0.337557	0.929874	0.010652	0.114866	0.363462
	(-2.8816)***	(0.3476)	(-2.1559)**	(0.7568)	(-2.9130)***
Effects Specification					
Period random effects					
R-squared	0.9746	0.8855	0.8827	0.9606	0.8475
F-statistic	194.6144***	39.2559***	38.2236***	123.794***	28.2117***
Hausman Test	Not reject: Ho	Not reject: Ho	Not reject: Ho	Not reject: Ho	Not reject: Ho

, **, *: statistically significant at 10%, 5% and 1% levels respectively. Estimations done by Eviews.*

During the period of 1995 – 1998, Thailand had an advantage in manufacturing with medium skill and technology intensity, crude rubber, petroleum, and plastic, Thailand could play both roles but, the iron and steel industry of Thailand had disadvantage in the GMS market as well as the role of exporter and importer. At that time, Thailand trade policy had still no drives of the manufacturing sector developed and had no political instability due to, the democracy of the people of government in the revolution, the uprising in capital of the country, and the majority of the nation business sectors could not operate. As the results, the policy had driven slowdown. After the events mentioned above, during the years 1999-2002, the new government and, trade policies that led to the battlefield to field with the development of trade with neighboring countries in terms of investment and technology collaboration, including, an agreement to protect the taken advantage of the developed countries. The Thai government's policy of financial liberalization led to excessive investment in 1999-2000. It had investment products to meet demand and speculation. Consistent with the results of the DRTCA index in 1999, Thailand had

an advantage in the role of importer in Laos, Cambodia, Viet Nam and Myanmar and Thailand role as an exporter in China and had advantages in the petroleum, iron and steel industry.

In 2000-2002, Thailand's economic crisis of monetary policy caused by the real estate industry, business was relevant to contraction of exports and imports. As a result, Thailand had disadvantage in the role of the importer, and exporter in the GMS countries in iron, and steel industry. Thailand also had an advantage in the crude rubber, petroleum, and plastic, but there was disadvantage in manufacturing with medium skill and technology intensity.

The DRTCA index for 2003-2006 shows that Thailand has a stronger advantage than Laos, Cambodia, and Myanmar for Thailand's role as an exporter in the crude rubber, petroleum, and plastic industries. Thailand has a stronger advantage than Viet Nam and China for Thailand role as importer in the petroleum, plastic, iron and steel industry. With support from Department of Export Promotion, Ministry of Commerce, Thailand, between 2005 and 2008, the import value of Thailand from the GMS countries increases of about 50%. During the same period, Thailand also increases its exports to the GMS countries about 55.23%. The relevant product items exported from Thailand to the GMS countries are computer and components, finished oil, natural rubber, plastic pellet, chemical product, iron and steel product. Especially in the iron and steel industry had changed from disadvantage into an advantage in the trade as an importer. As a result of the year 2005, Thai government provided the "ASEAN Integration System of Preferences" with one-way free trade of importing 850 product items exported from Myanmar to Thailand.

In 2007-2010, there were many investments in Laos, Cambodia and Myanmar with foreign investors in the GMS countries and other countries, including Thailand, China, India, Japan, Viet Nam, Malaysia, Republic of Korea, and The People Republic of China (PRC). Results of growth in both exports and imports of the GMS market and benefits from regional trade agreements (RTA). The DRTCA index during this period indicated that Thailand had the stronger advantage than the GMS in petroleum, crude rubber, plastic, iron and steel industries in the role of both exporter and importer. The GMS countries possessed the stronger advantage than Thailand, Thailand role as an exporter in manufacturing with medium skill and technology intensively.

Table 2: Thailand's Role and the Dynamic of Revealed Trade Balance Comparative Advantage (DRTCA) Index of the GMS Countries

Country- pair / Industry	**Thailand's role in the GMS market and DRTCA index**					
	Manufactures	Crude rubber	Petroleum	Plastic	Iron and steel	
1995-1998						
Thai-Laos			>1(+)	>1(+)	<1	(+)
Thai-Cambodia	>1(-)	>1(+)	>1(+)	>1(+)	<1	(+)
Thai-Viet Nam			>1 (-)	>1(+)	<1	(-)
Thai-Myanmar			>1(+)	>1(+)	<1	(+)
Thai- China			>1(-)	>1(-)	<1 (-)	
1999-2002						
Thai-Laos			>1(+)*	>1(+)	<1	(-)*

Thai-Cambodia	<1(+)	>1(+)	>1(+)*	>1(+)	<1 (-)*
			>1(-)	>1(-)	>1 (-), >1 (+)
Thai-Viet Nam			>1(+)*	>1(+)	<1 (-)*
Thai-Myanmar			>1(-)*	>1(-)	<1 (+)*
Thai- China					
2003-2006					
Thai-Laos			>1(+)	>1(+)	<1 (-), >1(+)
Thai-Cambodia	<1(+)	>1(+)	>1(+)	>1(+)	>1 (+)
			>1(-)	>1(-)	>1 (-), <1 (+)
Thai-Viet Nam			>1(+)	>1(+)	>1(-)
Thai-Myanmar			>1(-)	>1(-)	<1 (+), >1(-)
Thai- China					
2007-2010					
Thai-Laos			>1(+)	>1(+), >1(-)	>1 (-)
Thai-Cambodia	<1(+)	>1(+)	>1(+)	>1(+), >1(-)	>1 (-), >1 (+)
			>1 (-)	>1(-)	>1 (+), >1(-)
Thai-Viet Nam		<1(+)	>1(-)	>1(-)	>1 (-), >1(+)
Thai- China			>1(+)	>1(+)	>1 (+)
Thai-Myanmar					

* Only in 1999, Petroleum industry of Thailand has a DRTCA index as >1 (-) in Laos, Cambodia, Viet Nam and Myanmar market, in the China market has a DRTCA index as >1(+). For the Iron and steel industry, Thailand has a DRTCA index as >1 (-) in Laos, Cambodia, and Myanmar market. And the China market has a DRTCA index as >1 (+). (-) Thailand role as importer in the GMS market, (+) Thailand's role as exporter in the GMS market.

6.0 Conclusion

This paper empirically measures the competitiveness of business in five industries between Thailand and the GMS countries with the DRTCA index; the DRTCA indicates that reflects change the role of trade in Thailand with the GMS group and also has the results of advantage of trade consistently with the economic situation in each period. This is evidence to support the study of comparative advantage by measuring the formation DRTCA index to review all impacts of economic environment, trade and development policies that effect to how trade advantages are.

In terms of the influence of the GMS market, Thailand has a stronger advantage than the GMS countries for the role as an exporter in crude rubber. Thailand has a stronger advantage than Laos, Cambodia and Myanmar for the role as an exporter of petroleum, plastic, iron and steel industries. Thailand role as importer has a stronger advantage than China and Viet Nam in petroleum, plastic, iron and steel industries. Having the support of the Thai Board of Investment (BOI) therefore the trade volumes between Thailand and China had increased during the years 2003-2010, the Chinese trade surplus with Thailand. The growth rate of imports from China to Thailand was Up to 22% but the growth rate of exports from Thailand to China was at the level lower than the 21% per year.

This is the data source for the international trade position of Thailand and for searching for opportunities for cooperation in the ASEAN Economic Community (AEC). The strategies in developing this part of Thailand, have taken advantage of trade agreements, such as networking and collaboration with neighboring countries. Thailand adjusts improving the ASEAN production base on both Labor and technology, also including the development of distribution channels through transportation and logistics security in the sample used in setting new joint in the GMS countries, to promote participation of all sectors involving in visible and tangible policies o the joint study of feasibilities and benefits.

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