ANNALS OF ECONOMICS AND FINANCE **19-2**, 473–522 (2018)

Ricardian Comparative Advantage: Impact of Specialization on the Exportation of Products in ASEAN Countries

Mohammad Sharif Karimi and Mehran Malekshahian*

Aim of this research is to verify to which extent specialization affects exportation of products in six major countries of Association of Southeast Asian Nations (ASEAN) according to the traditional Ricardian theory of Comparative Advantage (CA). In this paper, firstly patterns of trade specialization of products at two-digit level of Harmonized System will be analyzed in Indonesia, Thailand, Malaysia, Singapore, Philippines, and Vietnam. Revealed comparative advantage (RCA) index and Lafay Index (LFI) are the main proxies measuring trade specialization to be calculated in this research. Afterwards we investigate the impact of specialization on the export of products in a gravity model during 1996-2011 for the whole sample and for each country separately. In order words, it is tested whether or not ASEAN export patterns are explained by Ricardian CA theory. To control for available endogeneity, heteroskedasticity, and fixed effects problems we use robust two-step Generalized Method of Moments (GMM) technique. Results of the GMM estimation suggest that specialization measured by both indices has significant positive impact on the export of products only in Philippines and Malaysia, which emphasizes on the applicability of Ricardian CA theory in these two countries.

Key Words: Comparative Advantage; Exports; ASEAN.
JEL Classification Numbers: F14, F11.

1. INTRODUCTION

Southeast Asia has an important position in the wider Asian economy: as link between China and the Far East with India and the Middle East. It has also played a major role in the world-economy during last few decades (Dixon, 1991). Countries in Southeast Asia are far more heterogeneous than are European and East European countries.

* Karimi: Department of Economics,Faculty of Social Sciences, Razi University, Kermanshah, Iran. Email: s.karimi@razi.ac.ir; Malekshahian: Faculty of Economic Sciences of University Putra Malaysia (UPM), Malaysia. Email: mehranmalekshahian@yahoo.com.

1529-7373/2018

Broad diversity in ethnicity, political regime, ecosystem, social structure, population, religion, economic performance, per capita income and GDP are the main characteristics among Southeast Asian countries (Ohno, 2002). Despite these diversities, these countries have the same interest in cooperation for peace and prosperity as reflected in the formation of the Association of Southeast Asian Nations (ASEAN) in 1967 (one of the most significant events in the history of Southeast Asia). Bilateral, trilateral and multilateral negotiations with the ASEAN bloc and other developed Asian countries have been implemented while some are in progress. ASEAN had already negotiated with New Zealand, Australia, China, Japan and the Republic of Korea.

In 1967, ASEAN was established by the five original member countries: Singapore, Malaysia, Indonesia, Thailand and the Philippines. In 1984, ASEAN was extended to include Brunei Darussalam, Vietnam in 1995, Laos PDR and Myanmar in 1997 and Cambodia in 1999. Enhanced integration between the ASEAN countries commenced in 1977 with the ASEAN Preferential Trading Arrangement, which was amended in 1995. Since this agreement, relations between ASEAN members have grown and deepened in importance and scope. Among these relations are customs, investment, trade and intellectual property.

In 1992, the ASEAN Free Trade Area (AFTA) was formed. The pace of integration slowed down because member states expressed concerns about national sovereignty and were reluctant to take steps that would lower the tariffs of protected industries. In addition to that, the economic crises of 1997 hit these economies severely. In 1992, AFTA was signed by Brunei, Indonesia, Malaysia, the Philippines, Singapore and Thailand. On January 1, 1993 it came into force. At that time, it covered a selection of non-agricultural goods, known as the inclusion list. Trade will eventually be completely liberalized within ASEAN members, with only a few exceptions allowed to remain permanently as stated in the AFTA.

The ASEAN Economic Community (AEC) agreement was signed by ASEAN leaders in October 2003 and the core of the agreement is a regional economic integration by 2020. The ASEAN countries will effort to improve the region into a stable, single market and production base, highly competitive, equitable economic development and fully integrated to the global economy. The AEC single market is based on free flow of goods, free flow of services, free flow of investment, free flow of capital and free flow of skilled labour. Import duties should be reduced to zero for all products except sensitive and highly sensitive products as unprocessed agriculture products.

Differential rates of change in accumulation of production factors or increased trade integration of other countries may influence a country's comparative advantage in regional and international trade. ASEAN countries

recent move towards export oriented development strategy might have altered the picture of comparative advantage in the world markets. It is important therefore, to explore the structure of comparative advantage of ASEAN countries and the extent to which the economies compete with each other in the region and global market for exportable commodities.

Therefore, obtaining information about the relative comparative advantage strength of industries of ASEAN countries can be advantageous to answer the main questions and helping to actively influence region's development. The CA pattern of industries that thus emerges can serve as a guideline for formulating governments' policies on resources allocation and trade patterns. Traditional Ricardian theory of CA is the main focus of this paper that enables us to investigate the patterns of CA using accessible data on trade. Therefore, the aim of this contribution is initially to obtain patterns of CA and specialization by calculation of CA indices for ASEAN countries, and ultimately to identify and check whether CA can affect the export of products in ASEAN countries. If the Ricardian CA exists and it enhances exportation of product, the AEC can follow export and CA oriented policies for the development of ASEAN.

The organization of the rest of this paper is as follows. In the second section, we briefly discuss the literature review on the theories of comparative advantage and the related issues. The third section explains the approach and econometrics methodology used in this research. Main analysis and econometrics results will be provided in the fourth section. Finally in section fifth we will conclude.

2. LITERATURE REVIEW

David Ricardo (1819) formulated the theory of CA as a static model of trade between two countries that produce two goods using homogeneous labour as the only factor of production. Under the assumptions of internationally mobile goods and immobile labour, transport costs equaling to zero, perfect markets and constant returns to scale, it is shown that each country will benefit from trade if it specializes in the production of the particular good in which it enjoys a CA in terms of real costs and exchanges that good for products in which it does not.

One test of the Ricardian model as stated in terms of labour efficiency was done by MacDougall (1951), who wanted to test the hypothesis that differences in relative labour productivities of the U.K. and the U.S. explain their corresponding relative exports to the rest of the world (other countries except the U.S. and U.K.) using data for 1937. The results of this cross-section analysis were that U.S. exports to the rest of the world exceed the corresponding U.K. exports (that is $\frac{Export_{U.S.}}{Export_{U.K.}} > 1$) in those industries where U.S. labour productivity was at least twice U.K. labour

productivity. MacDougall concluded the difference in labour productivity and not the differences in wages was the primary factor in determining the export performance of these two countries.

To move from Ricardo's hypothetical world to reality, the simple Ricardian model needed to be expanded in several directions: in the direction of the number of goods, countries, and factors of production. Haberler (1936) and Viner (1937) formed the chain of CA by ordering commodities in terms of relative costs in producing them. The inverse of these productivity ratios multiplied by the relative wage ratios in each country resulted in an ordered set of relative prices. One country produces the first subset of commodities with price ratios less than one, and other country produces the second set of commodities with price ratios exceeding one. The borderline between these two sets of commodities depends on demand conditions, but the ordering does not. This was taken as evidence that it was not possible to talk about complete specialization as the general rule.

The neoclassical approach in explaining the sources of the world trade pattern is attributed to the works of Heckscher (1919), Ohlin (1935), Stolper-Samuelson (1941), and Samuelson (1948) that became a branch of neoclassical general equilibrium theory. The neoclassical economists explain the commodity composition of trade by introducing the factor proportions (endowments) theory. This theory states that each country will export (import) the commodity that intensively utilizes or embodies the abundant (scarce) factor. The essentials of the neoclassical theory of CA can be also presented in terms of familiar H-O model. This model has been developed from very restrictive assumptions that ensure the logical truth of the theorem (Bhagwati, 1964).

The first empirical testing of factor proportions theory, or H-O theory, was done by Wassily Leontief (1954). In the study, revealing that in 1947 U.S. exports were more labour intensive than competitive imports became the basis of what is known as the Leontief Paradox. Since the U.S. was by far the most capital abundant country in the world at that time, this result was in contradiction with what the H-O theory predicts.

There have been alternative theories in the literature that tried to explain international trade more closely to reality than Ricardian or H-O theories tried. The technological gap theory of international trade (or neo technology theory) described by Posner (1961) emphasized the importance of country's capabilities for technological innovations. On the other hand, the product cycle model, described by Vernon (1966) and Hirsch (1967, 1976), relates those changes caused by technological innovation to sequence of phases in an industry's life cycle and emphasizes the learning capabilities of country. Linder (1961) proposed a theory based on the assumption that production functions differ between countries and that the domestic representative demand is necessary precondition for export. In other words,

a sufficient size of the domestic market is needed to enable efficient production in an industry, which at a later stage may turn into an export industry.

Balassa (1965) introduced the concept of revealed comparative advantage (RCA) following the Ricardian theory of CA. He introduced a new index as a proxy measuring RCA. He suggested that the CA could be revealed by looking at observable data, derived from post trade situation, since according to the theory of trade the structure of exports is supposed to be determined by CA. In this alternative approach, observable variables, such as data on production, consumption, exports and imports, may reflect relative costs as well as differences in quality, goodwill, servicing, etc. In the words of Balassa, RCA can be indicated by the trade performance of individual countries in regard to manufacturing products, in the sense that the commodity pattern of trade reflects relative costs as well as differences in non-price factors.

Most of the authors, who questioned the validity of the RCA indices as indicators of CA, accepted true and theoretically consistent indicators of CA across-countries only those that are based on the differences in autarkic relative prices. Since autarkic relative prices — the true indicators of CA- are unobservable, they are approximated by RCA indices, and CA is taken to be what post-trade, observable variables indicate. Thus, for these authors, it is clearly impossible to derive the true measures of CA, based on autarky prices. They argued that additional assumptions that would yield a stronger theoretical linkage between pre-trade relative prices and observable structures of production and trade are needed in order to assess the consistency of the RCA approach (Hillman, 1980). Starting from these theoretical grounds, Harkness and Kyle (1975), Bowen (1983), and Marchese De Simone (1989) have analyzed the properties of the various indices constructed to measure CA.

Porter (1990) uses RCA to identify strong sectoral clusters, Amiti (1999) analyzes specialization patterns in Europe, Proudman and Redding (2000) focus on the dynamics of comparative advantage, Bojnec (2001) analyzes agricultural trade, Hinloopen and Van Marrewijk (2001; 2004) study the dynamics of the empirical of RCA. Tan (1992) has mentioned in a research that the inter industry dynamic comparative advantage of the Singapore manufacturing sector during 1970-1983 is significantly explained by the H-O theory. Fertö and Hubbard (2003) have presented an analysis of the competitiveness of Hungary's agro-food products in relation to that of the EU, based on four indices of revealed comparative advantage, computed for the period 1992 to 1998.

Oelgemoller and Westermeier (2009) have analyzed comparative advantage by using RCA indices for six European countries: Austria, France, Germany, Italy, the Netherlands and the UK. As they have concluded,

with respect to the trade performance index, the variance decreased between 1995 and 2006. In 1995, there was a gap between the country with the highest trade performance index and the one with the lowest trade performance index. The gap decreased by 2006, while the average value remained almost the same.

Yue and Hua (2002) calculated RCA for China during 1980-2000 and provinces of China during 1990-1998. They used RCA as the main independent variable in a reduced form export equation for three major industries with highest RCA in average. These three products are Chemicals, Manufacture materials and finished manufactures, and Machinery and equipment. However, they did not include values of RCA for the RCA variable, instead they only used a dummy variable that takes value 1 if the province has CA in that product and get value 0 otherwise. They used OLS, Fixed Effect estimator, and Two-step least squares regressions. Their finding showed that RCA has a negative impact on the export of chemical products, while it has positive significant effect on the export of Manufactures and Machineries.

In spite of all that has been discussed in this section, there is still a gap in the literature that this contribution tries to fill in and improve the literature. In fact, this contribution tries to find patterns of RCA in six major ASEAN members. The most significant issue is the econometrics analysis, which checks whether or not the export patterns of products in these countries is explained by Ricardian theory of CA. In other words, using RCA indices it is tested if CA can have any impact on the export of the products. In other words according to the Ricardian theory, industries with higher RCA are more probable to export. Therefore, improvement in the past CA should increase the exportation of the product. To check the applicability of this theory in ASEAN countries, a gravity model will be used. Dual causality and endogeneity of RCA indices in the regressions are carefully controlled via appropriate econometrics techniques to have an effective contribution in the literature.

Many scholars such as Mátyás et al. (1997), Bandyopadhyay and Roy (2007), and Thede and Gustafson (2012) have used gravity model to test various hypotheses in trade. Econometric specifications of gravity model have been modified during years. Mátyás (1997) suggested careful consideration for time and country specific effects in the modeling because without controlling for them the estimation would be biased. Moreover, Mátyás (1998) addressed homogeneity of the reporter countries and partner countries separately. The results of such analysis can provide good frameworks for the implementation of policies. When industries with higher RCA can better perform in the export than industries with lower RCA, governments should thus support the specialization of industries with CA. This can be an important issue that ASEAN policy makers need to know.

3. METHODOLOGY

Most of empirical studies of CA resort to the RCA approach, which looks at observable data from trade. In this approach, the CA concept can be quantified in the form of an index of RCA to determine trade pattern, specialization, and industries of usual strength or weakness in international competitive terms, and in a dynamic context. We introduce two indices of RCA in next subsections that will be hired in this study. These two indices will be calculated for 96 goods at 2-level of Harmonized System (HS) revision 1996 during 1996-2011 in six major ASEAN members: Indonesia, Malaysia, Singapore, Thailand, Philippines, and Vietnam[1]. Afterwards, these indices will be used in an econometric analysis whose specifications will be discussed in the third subsection of this section.

3.1. Balassa revealed comparative advantage index

Balassa (1965) refined Liesner's methodology for the purpose of identifying the enduring effects of trade liberalization: the reallocation of resources following the freeing of trade barriers. He used two different indices: the export-import ratio and an export performance index. In this research we use his export performance index that is based on export data only. It is obtained by comparing the relative shares of a country in the world exports of individual commodities. To make the data comparable he transformed them by dividing a country's share in the exports of a given industry by its share in combined exports of goods of all countries, and expressing the results in index number form, as follows:

$$RCA_{ijt} = \left[\frac{X_{ijt}}{X_{it}^{w}} / \frac{\sum_{i}^{n} X_{ijt}}{\sum_{i}^{n} X_{it}^{w}} \right] \tag{1}$$

where X_{ijt} is the export of industry i from country j at time t; X_{it}^{w} is the export of industry i from all countries in the world at time t; $\sum_{i}^{n} X_{ijt}$ is the total export of country j (summation of all n industries' exports from country j) at time t; and $\sum_{i}^{n} X_{it}^{w}$ is the total export of goods in all over the world. If this exports share index is more than one, that is, when that country enjoys more comparative advantage in exports of industry i than other countries do (the average for the world or a group of countries). It is interpreted to mean that the country has a comparative advantage in the trade of that industry relative to other manufacturing industries.

Balassa also introduced another index similar to (1) and instead of total export he used import of the commodity (industry i). Balassa made more use of (1) based on export data only than this one, as the basic index of RCA. He argued his choice by the fact that imports will be affected by

[1]The reason to choose these six members only is the availability of data.

inter-country differences in tastes, as well as by inter-industry disparities in the degree of protection, and that the former, as well as net exports, should be used more like additional measure of RCA.

3.2. Lafay revealed comparative advantage index (LFI)

We will also measure and analyze ASEAN countries' changing pattern of trade specialization by applying an approach originally adopted by Lafay (1992) in our study. The Lafay Index defines a country's trade specialization with regard to a specific good as the difference between the trade balance of that good and the country's overall trade balance, weighted by the good's share in total trade. More specifically, in the version proposed by Bugamelli (2001), Lafay's revealed comparative advantage index (LFI) will be as follows:

$$LFI_{ijt} = \left\{ \left[\frac{X_{ijt} - M_{ijt}}{X_{ijt} + M_{ijt}} - \frac{\sum_i^n (X_{ijt} - M_{ijt})}{\sum_i^n (X_{ijt} + M_{ijt})} \right] \times \left[\frac{X_{ijt} + M_{ijt}}{\sum_i^n (X_{ijt} + M_{ijt})} \right] \right\} \times 100 \tag{2}$$

Where X_{ijt} and M_{ijt} denotes exports and imports transaction of good i in country j with the rest of the world, and n is the total number of industries. By construction, for each period t, LFI sums up to zero across goods. As it is observed, unlike RCA, LFI does not depend on the total export or total import of all countries in the world and it only depends on the respective values of a specific country. This index can determine self-sufficiency of a country. In other words, for each good i the index takes values between plus and minus 50, which respectively represent the boundaries in the case of full trade specialization and full de-specialization. Therefore, plus 50 shows that the country has the most comparative advantage (self-sufficiency) in that industry, while minus 50 indicates the most comparative disadvantage in the industry.

3.3. Econometrics specifications

In the econometric analysis, the impact of comparative advantage (CA) and specialization on the export of products from ASEAN members will be analyzed. The main hypothesis of this analysis is according to the theories of CA since the traditional concept of Ricardo (1819), which suggests that higher CA for a specific product increases the possibility of the country as a net exporter of that product. This hypothesis will be tested in a well-known gravity model using econometric techniques. It is important to see whether RCA and LFI can affect exports of products similarly. RCA as a measure of CA of the products and LFI as a measure of specialization in sectors will be included in the estimations separately. The data of analysis includes 96 products at two-digit level of HS1 (1996) in six major ASEAN countries during 1996-2011. The complete description of these 96 products with their HS-codes is provided in the appendix.

CA and specialization measures will be included in the gravity model as the main independent variable in the following equation:

$$\begin{aligned}\ln(Exp_{irpt}) &= c + \alpha_i + \gamma_r + \eta_p + \lambda_t + \beta_1 X_{irt} + \beta_2 \ln Y_{rt} + \beta_3 \ln Y_{pt} \\ &+ \beta_4 \ln(P_{rt} - P_{pt}) + \beta_3 \ln(Dist_{rp}) + Z_{rpt} + \varepsilon_{rpt} \qquad (3)\end{aligned}$$

Where Exp_{irpt} is the export of product "i" from reporter country "r" to the partner country "p" at time "t". "c" is the intercept. "X_{irt}" is the RCA or LFI index for product "i" of the reporter country at time "t". "Y" stands for the real GDP in local currency units. "P" refers to the real GDP per capita in US dollars. "$Dist_{rp}$" is the distance from the reporter country to the partner country in kilometers. "Z" is a vector of some control variables as follows:

$\ln Exchange$: natural logarithm of exchange rate of one unit of partner currency in the reporter country; "Cus": Customs and other import duties percentage of tax revenue in the partner country; "TMW": Tariff rate of most favored nation in percentages, weighted mean of all products; "RTA": Dummy variable that takes value of 1 if both reporter and partner countries are ASEAN members, and takes value of 0 otherwise.

The data for the first three control variables is collected from the World Development Indictors (WDI) database of the World Bank[2].

"α_i", "γ_r", "η_p", and "λ_t" are respectively sector, reporter country, partner country, and times specific effects. "ε_{rpt}" is the error term.

Running normal OLS estimation for the above model for both RCA and LFI has given biased results[3]. In fact, Breusch-Pagan / Cook-Weisberg test for heteroskedasticity, rejected the null hypothesis of constant variance of the error term for models. Moreover, the causality between the dependent variable and some of the independent variables are not in one direction. According to the traditional CA theories, CA should positively affect the exportation of products. However, calculation of the RCA and LFI indices are both including exportation of products. Even similar double causality can be found for GDP of both reporter and partner countries. When GDP of the reporter country increases, the exportation of products is also increased, while exports are included in the calculation of GDP. When GDP of the partner country increases, the country is richer and the demands for importation of products are also increased, while imports are also included in the calculation of GDP. Therefore, there can be endogeneity problem in the estimation of this model and the error term might be biased. Moreover, Ramsey RESET test using powers of the fitted values of the dependent variable rejected the null hypothesis of having no omitted

[2]Can be found at: http://data.worldbank.org/data-catalog/world-development-indicators

[3]These estimations can be found in the appendix for reader's notice.

variables for the model. Thus, the error term is biased for both endogeneity and omitted variable bias.

To control for all above-mentioned problems in addition to the sector, country, and time specific effects, Generalized Method of Moments (GMM) will be used as estimation technique of the models. Arellano and Bond (1988) and Arellano and Bond (1991) consistent GMM is a linear dynamic panel-data model including lags of dependent variable and lags of some independent variables. This estimation technique is specially designed for panels with few time periods and many individuals; with also explanatory variables that are correlated with past and current error terms; with fixed effects and possible heteroskedasticity and autocorrelation within individuals. The construction of this estimator allows inclusion of lags and differences of variables as instruments to decrease the unobservable effects correlating with the lags of the dependent variable. Moreover, it is possible to add some additional instruments to control for the omitted variable bias. In order to control for the biased estimators because of available heteroskedasticity in the estimations, after two-step estimation, WC-robust estimator proposed by Windmeijer (2005) will be used for variance-covariance matrix.

There are two post estimation tests for this GMM showing the correct construction of variables in the model. Arellano-Bond test for zero autocorrelation in first-differenced errors in GMM two-step regression with the null hypothesis of no autocorrelation is the first test showing the suitable order of dependent variable's lags. Sargan test of over identifying restrictions in GMM two-step regression with the null hypothesis of valid over identifying restrictions can show the suitable inclusion of instruments in the model.

In the next section, GMM estimation results of the RCA group and LFI group will be provided. In each group the estimation will be divided in 7 categories. The first category includes the data of the exportation of products from all 6 major ASEAN members. In other 6 categories, estimation will be over the exportation of each of the major countries separately. Lags order, differencing orders, lags order of differences, and additional instruments are considered to achieve the best post estimation test results. Additional instruments in the estimations are as follows:

"$REER_p$" refers to the Real Effective Exchange Rate of partner country; "$\ln(Dist_{rp})$" is the log of the distance between the reporter and partner countries in kilometers; "yr1996-yr2011" are the year dummies taking 1 if the observation corresponds to that year (e.g. yr2000=1 if the observation is for year 2000); "RTA" as explained earlier is the dummy variable takes value of 1 if both reporter and partner countries are ASEAN members, and takes 0 otherwise; and "Cus" is the custom duties share of total tax revenues of the partner country. "$\ln(Dist_{rp})$" and "RTA" are not included

in the main estimation because they are constant over time and they are dropped out of the model. Moreover, "Cus" is dropped out of the estimations because of collinearity.

TABLE 1.

Description of data and sources

Country	Description of Data	Duration	Source
Indonesia	Exports and Imports, HS 96 products	1996-2011	UN comtrade database
Malaysia	Exports and Imports, HS 96 products	1997-2011	UN comtrade database
Singapore	Exports and Imports, HS 96 products	1997-2011	UN comtrade database
Thailand	Exports and Imports, HS 96 products	1999-2011	UN comtrade database
The Philippines	Exports and Imports, HS 96 products	2000-2011	UN comtrade database
Vietnam	Exports and Imports, HS 96 products	2000-2010	UN comtrade database
For all	Data on distances between countries		CEPII website*
For all	Other data on, GDP, Customs and duties, Tariffs, exchange rate		World Development Indicators of World Bank

*: Can be found at: http://www.cepii.fr/anglaisgraph/bdd/distances.htm

The data for the export and import of the two-digit harmonized codes (HS-96) products are compiled from UN COMTRAD databases. Recently, World Integrated Trade Solution (WITS) has gathered and provided trade data from different international organizations such as UN COMTRADE. The data for this study has been extracted from the advanced query data manager of COMTRADE in WITS website[4]. Table 1 describes the data and their source for each country. The most recent data is gathered in this analysis to achieve new and robust results.

4. RESULTS

4.1. Balassa Revealed Comparative Advantages (RCA) Index

Table 2 represents five industries with their HS-Codes at two-digit level for each of six major ASEAN countries that have had high CA and specialization during the period of analysis[5].

Indonesia has significant RCA in product with HS-code 80(Tin and articles thereof) in 2008. Even the average RCA for this product is highest during the period. HS-codes 15(Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes), 14(Vegetable plaiting materials; vegetable products not elsewhere specified or included), 26(Ores, slag and ash), and 9(Coffee, tea, mate and

[4]Can be found at: http://wits.worldbank.org/wits/

[5]Complete tables of RCA and LFI indices for all 96 products of each country can be found in the appendix.

spices) are the next products with highest RCA index. Among 96 sectors, in 31 of them Indonesia has CA according to the average of RCA greater than 1 during the period of analysis. HS-code 43(Fur skins and artificial fur; manufactures thereof), 81(Other base metals; cermets; articles thereof), 37(Photographic or cinematographic goods), 93(Arms and ammunition; parts and accessories thereof), 02(Meat and edible meat offal) had the lowest values for RCA index during 1996-2011 (RCA values less than 0.06). In fact, Indonesia has Comparative Disadvantages (CD) for the exportation of these products. HS-codes 15(Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes), 92(Musical instruments; parts and accessories of such articles), 14(Vegetable plaiting materials; vegetable products not elsewhere specified or included), 55(Man-made staple fibers), and 74(Copper and articles thereof) have the highest improvement of specialization during the period of analysis. They also have positive average annual growth during these years. RCA indices for HS-codes 26(Ores, slag and ash), 44(Wood and articles of wood; wood charcoal), 09(Coffee, tea, mate and spices), 46(Manufactures of straw, of esparto or of other plaiting materials; basket ware and wickerwork), and 64(Footwear, gaiters and the like; parts of such articles) have decreased more than any other products during the period.

In Malaysia, HS-code 15(Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes) has the highest RCA index in 2008; besides, it has the highest average RCA and changes of RCA during the period. Among all 96 products, only 14 products have CA in Malaysia according to their average RCA greater than 1 during the period of analysis. Similarly to Indonesia, Malaysia has CA in exportation of products with HS-code 80(Tin and articles thereof) and 14(Vegetable plaiting materials; vegetable products not elsewhere specified or included). For both of these products the level of specialization has been improved with positive average annual growth. HS-codes 40(Rubber and articles thereof) and 44(Wood and articles of wood; wood charcoal) have also high RCA indices in Malaysia. Lowest average indices of RCA during 1997-2011 in Malaysia refer to HS-codes 10(Cereals), 45(Cork and articles of cork), 47(Pulp of wood or of other fibrous cellulosic material; recovered paper or paperboard; paper & paperboard & articles thereof), 96(Miscellaneous manufactured articles), and 02(Meat and edible meat offal). Products 45(Cork and articles of cork), 86(Railway or tramway locomotives, rolling-stock & parts thereof; track fixtures fittings & parts thereof; mechanical traffic signaling equipment), 93(Arms and ammunition; parts and accessories thereof), 53(Other vegetable textile fibers; paper yarn and woven fabrics of paper yarn), 81(Other base metals; cermets; articles thereof), and 47(Pulp of wood or of other fibrous cellulosic material; recovered paper or paperboard; paper & paperboard & articles thereof) have average

annual growth rates of RCA greater than 40 percent. Nevertheless, the average values for the RCA indices of these products during 1997-2011 are less than 0.20. In fact, Malaysia has CD in the exportation of these products. These findings suggest that Malaysia tried to support and improve these industries.

In Philippines, HS-code 46(Manufactures of straw, of esparto or of other plaiting materials; basket ware and wickerwork) had the highest RCA index in 2000 and the highest average of the index during the period. Products with HS-codes 13(Lac; gums resins and other vegetable saps and extracts), 44(Wood and articles of wood; wood charcoal), 15(Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes), and 08(Edible fruit and nuts; peel of citrus fruit or melons) have the next high RCA indices in Philippines. Among 96 products, only 20 of them have CA during the period of analysis as their average RCA is above 1. Philippines has the most CD in exportation of products with HS-code 75(Nickel and articles thereof), 45(Cork and articles of cork), 37(Photographic or cinematographic goods), 09(Coffee, tea, mate and spices), and 59(Impregnated, coated, covered or laminated textile fabrics; textile articles for industrial use), as their average RCA during 2000-2011 is the lowest among all sectors. HS-codes 10(Cereals) had the biggest average annual growth of RCA with 10475 percent.

TABLE 2.

Five Industries with highest CA and specialization in six major ASEAN countries

	Indonesia	Malaysia	Philippines	Singapore	Thailand	Vietnam
Highest RCA	80, 15, 14, 26, 9	15, 80, 14, 44, 40	46, 13, 44, 15, 8	80, 14, 85, 24, 91	16, 40, 10, 80, 17	46, 9, 3, 64, 14
Highest Average of RCA	80, 15, 14, 26, 92	15, 80, 44, 40, 85	46, 13, 15, 85, 8	80, 85, 14, 91, 29	16, 40, 10, 80, 17	46, 9, 3, 64, 10
Highest Changes of RCA	15, 92, 14, 55, 74	15, 14, 80, 78, 18	13, 44, 24, 17, 8	29, 49, 88, 33, 89	49, 40, 17, 11, 80	61, 16, 11, 59, 94
Highest Average Annual Growth of RCA	75, 50, 10, 31, 93	45, 86, 93, 53, 81	10, 86, 51, 66, 2	93, 10, 47, 97, 45	88, 89, 97, 93, 49	47, 79, 51, 75, 43

Source: Own calculations

The huge growth of RCA for this product in Philippines is mainly because its exportation increased significantly in 2006. In fact, total exportation of this product was about 184 thousand of USD, and in 2006 it became 237 millions of USD. After 2006, its exportation dropped to around 1 million of USD. Therefore, a huge growth of RCA is observed. Similarly to the Malaysian patterns, almost all products with average RCA indices smaller than 1 (products with CD) have had significant positive average annual growth rates. Therefore, support of weak industries with high CD is also observed in Philippines.

In Singapore product with HS-code 80(Tin and articles thereof) has the highest RCA index in 2004. The average value of RCA during the pe-

riod of analysis for this product is also the highest among all other products. HS-codes 14(Vegetable plaiting materials; vegetable products not elsewhere specified or included), 85(Electrical machinery & equipment & parts thereof; sound recorders & reproducers, television image & sound recorders & reproducers), 24(Tobacco and manufactured tobacco substitutes), and 91(Clocks and watches and parts thereof) are the next products with high CA in Singapore. Among all 96 sectors, Singapore has enjoyed CA in only 11 sectors according to the average of RCA greater than one during 1997-2011. This suggests that Singapore has been specialized in a few varieties of products. HS-code 93(Arms and ammunition; parts and accessories thereof) has the biggest average annual growth rate of RCA during the period. HS-codes 10(Cereals), 47(Pulp of wood or of other fibrous cellulosic material; recovered paper or paperboard; paper & paperboard & articles thereof), 96(Miscellaneous manufactured articles), 45(Cork and articles of cork) and 51(Wool, fine or coarse animal hair; horsehair yarn and woven fabric) refer to the products with average annual growth rate of RCA greater than 20 percent in Singapore. However, the average RCA of these products are very small and Singapore has CD in the exportation of these products. In fact, HS-codes 43(Fur skins and artificial fur; manufactures thereof), 10(Cereals), 02(Meat and edible meat offal), 53(Other vegetable textile fibers; paper yarn and woven fabrics of paper yarn), 45(Cork and articles of cork), and 51(Wool, fine or coarse animal hair; horsehair yarn and woven fabric) have the lowest average RCA (less than 0.03) during 1997-2011.

In Thailand products with HS-code 16(Preparations of meat, of fish or of crustaceans, mollusks or other aquatic invertebrates), 40(Rubber and articles thereof), 10(Cereals), 80(Tin and articles thereof), and 17(Sugars and sugar confectionery) have the highest RCA indices and the highest average of this index during 1999-2011. Thailand is specialized in the export of these products. Average annual growth of RCA for HS-codes 16(Preparations of meat, of fish or of crustaceans, mollusks or other aquatic invertebrates) and 10(Cereals) is negative but very close to zero. Among 96 sectors, Singapore has CA in 36 of them according to the average RCA indices greater than one during the period of the analysis. In comparison with other countries studied in previous subsections, Thailand exports bigger varieties of products to the international markets, which have great CA. Specialization accompanied with diversification, can be important factors in growth of industries. HS-codes 45(Cork and articles of cork), 75(Nickel and articles thereof), 86(Railway or tramway locomotives, rolling-stock & parts thereof; track fixtures fittings & parts thereof; mechanical traffic signaling equipment), 96(Miscellaneous manufactured articles), and 43(Fur skins and artificial fur; manufactures thereof) refer to the products with the most CD. 43 sectors with positive average annual growth of RCA have

CD. RCA of products with HS-codes 88(Aircraft, spacecraft, and parts thereof), 89(Ships, boats and floating structures), 93(Arms and ammunition; parts and accessories thereof), and 96(Miscellaneous manufactured articles) is growing with the rate higher than 100 percent in yearly average. The average RCA of these products during 1999-2011 is respectively 0.42, 0.2, 0.03, and 0.14.

In Vietnam five maximum values for RCA index refer to products with HS-codes 3(Fish and crustaceans, mollusks and other aquatic invertebrates), 9(Coffee, tea, mate and spices), 46(Manufactures of straw, of esparto or of other plaiting materials; basket ware and wickerwork), 64(Footwear, gaiters and the like; parts of such articles), and 14(Vegetable plaiting materials; vegetable products not elsewhere specified or included) . Except for 14, other four products have also highest average annual RCA index during 2000-2010. Vietnam has had CA in 29 products among 96 products according to the average RCA index greater than 1 during the period of analysis. Similar to other countries, almost all products with big average annual growth of RCA have CD in Vietnam. Again, it suggests that industries with weak performance in the international markets are supported to improve their share in the market. For instance, RCA of HS-code 47(Pulp of wood or of other fibrous cellulosic material; recovered paper or paperboard; paper & paperboard & articles thereof) with highest average growth of 829 percent, in 2010 has become 10 times its initial value in 2001.

4.2. 4.2 Lafay Index (LFI)

Since LFI index also considers imports of products, it can better illustrate self-sufficiency of the domestic industry. Not only the pattern of trade of the products, but also the pattern of consumption of products can be interpreted from this index. In other words, a country is more self-sufficient and more specialized in the products with greater values of LFI. However, it is important to consider that the maximum value for LFI is 50 when there is no import of the product and there is only export of that product.

TABLE 3.

Five Industries with highest CA and specialization in six major ASEAN countries

	Indonesia	Malaysia	Philippines	Singapore	Thailand	Vietnam
Highest LFI	27, 15, 44, 85, 40	84, 27, 15, 44, 85	85, 84, 62, 44, 15	84, 85, 29, 39, 30	40, 87, 84, 16, 10	27, 3, 64, 62, 61
Highest Average of LFI	27, 15, 44, 62, 26	15, 27, 84, 44, 40	85, 85, 62, 61, 15	84, 85, 29, 39, 30	40, 16, 84, 87, 10	64, 27, 62, 3, 61
Highest Changes of LFI	84, 15, 87, 29, 40	15, 72, 89, 39, 87	44, 74, 26, 87, 15	85, 29, 89, 90, 88	40, 88, 87, 39, 29	87, 61, 85, 55, 71
Highest Average Annual Growth of LFI	86, 97, 56, 60, 50	43, 89, 97, 88, 95	71, 90, 69, 7, 45	30, 89, 90, 81, 86	58, 48, 97, 91, 86	4, 14, 66, 44, 2

Source: Own calculations

According to table 2, in Indonesia the maximum value for LFI is 9.12 for HS-code 27(Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes). Products with HS-code 27(Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes), 15(Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes), 44(Wood and articles of wood; wood charcoal), 85(Electrical machinery & equipment & parts thereof; sound recorders & reproducers, television image & sound recorders & reproducers), and 40(Rubber and articles thereof) have the highest LFI index in Indonesia. Comparing with RCA, only product 15(Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes) is among the five highest RCA index. HS-codes 84(Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof), 29(Organic chemicals), 72(Iron and steel), 87(Vehicles other than railway or tramway rolling-stock, and parts and accessories thereof), and 10(Cereals) refer to the products with lowest specialization, as their average LFI values are lowest. In fact, the negative values for LFI can suggest that Indonesia has highest de-specialization in these products. Moreover, among 59 products with positive average annual growth of LFI, 20 have positive average of LFI during the period of analysis and the rest 39 products have negative average of LFI. This might suggest that less specialized sectors have been more probable to improve.

In Malaysia products with HS-codes 84(Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof), 27(Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes), 15(Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes), 44(Wood and articles of wood; wood charcoal), and 85 have enjoyed highest LFI values during some years. In other words, Malaysia had highest specialization in these products for some specific years. It is important to note that product 85(Electrical machinery & equipment & parts thereof; sound recorders & reproducers, television image & sound recorders & reproducers) has the lowest average LFI rate during 1997-2011. In fact, its maximum specialization was in 1997 with LFI 1.68. Then with an average annual growth rate of -11 percent, the LFI value dropped to -0.004 in 2011. The interesting issue is that this product was the top fifth product with highest average RCA in Malaysia. Even though it enjoyed a high CA according to RCA index, it lacks specialization more than any other products during the period of analysis given its lowest LFI value. In spite of a high exportation of product 85 from Malaysia, the importation of it seems to be higher. Products 15 and 44 are among the top 5 specialized products according to both indices. In fact Malaysia has CA in the exportation of these two products given their high values of RCA and LFI.

Products with HS-codes 85(Electrical machinery & equipment & parts thereof; sound recorders & reproducers, television image & sound recorders & reproducers), 72(Iron and steel), 87(Vehicles other than railway or tramway rolling-stock, and parts and accessories thereof), 10(Cereals), and 74(Copper and articles thereof) have the lowest values of average LFI during 1997-2011 in Malaysia. Malaysia has the highest de-specialization in these sectors. Among 60 products with positive average annual growth of LFI, 50 have average LFI values less than zero. In other words, all of these 50 sectors have been de-specialized during the period, and they seem to have been improving with positive growth rates of specialization during years.

In Philippines products with HS-codes 85(Electrical machinery & equipment & parts thereof; sound recorders & reproducers, television image & sound recorders & reproducers), 84(Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof), 62(Articles of apparel and clothing accessories, not knitted or crocheted), 44(Wood and articles of wood; wood charcoal), and 15(Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes) have highest LFI values during 2000-2011. Comparing with RCA index it is observed that HS-codes 44(Wood and articles of wood; wood charcoal) and 15(Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes) had also high values of RCA in Philippines. Also products 85(Electrical machinery & equipment & parts thereof; sound recorders & reproducers, television image & sound recorders & reproducers), 84(Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof), and 62(Articles of apparel and clothing accessories, not knitted or crocheted) have had average RCA during the period above 1.37, which suggest that the levels of specialization for these five sectors are high according to both measures. The highest annual growth of LFI is 58122 percent in average of the period for product 71(Pearls, precious or semi-precious stones, etc, & articles thereof; imitation jewellery; coin) that had positive average LFI during these years (even in 2000 and 2011 LFI of this product was positive). Among 62 products with positive average annual growth of LFI, 40 of them have negative LFI in average of the years. This simply suggests that weaker industries tend to evolve to enjoy specialization. It is also interesting to mention that five sectors with most de-specialization in Philippines are respectively with HS-codes 27(Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes), 10(Cereals), 72(Iron and steel), 39(Plastics and articles thereof), and 29(Organic chemicals) according to their average LFI values during 2000-2011. Their maximum values of their LFI during the period have been negative and they have not evolved to enjoy positive values of LFI.

In Singapore products with HS-codes 84(Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof), 85(Electrical machinery & equipment & parts thereof; sound recorders & reproducers, television image & sound recorders & reproducers), 29(Organic chemicals), 39(Plastics and articles thereof), and 30(Pharmaceutical products) are the 5 products with highest LFI values during years and also during the 1997-2011 in average. Comparing with RCA, it is observed that except product 30, other products have RCA and average of RCA during the period greater than 1. Low value of RCA for HS-code 30(Pharmaceutical products) shows that Singapore does not have CA in the exportation of this product. However, positive value of LFI and average of LFI during the period suggest that Singapore is specialized in product 30(Pharmaceutical products). Lowest specialization is faced in sectors with HS-codes 27(Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes), 88(Aircraft, spacecraft, and parts thereof), 87(Vehicles other than railway or tramway rolling-stock, and parts and accessories thereof), 72(Iron and steel), and 73(Articles of iron or steel) according to the lowest average of LFI during 1997-2011. Even the maximum value of LFI for these products is negative. Singapore did not enjoy specialization in these sectors during the period of analysis. In fact, according to the positive average of LFI during the period, Singapore enjoyed specialization in 19 sectors among which only 8 sectors improved with positive average annual growth. Among 77 products with negative average LFI (facing de-specialization), 32 products have had positive average annual growth rates. In other words, 40 sectors growing with positive average growth are mostly the ones with less specialization.

Thailand has highest specialization in sectors with HS-codes 40(Rubber and articles thereof), 87(Vehicles other than railway or tramway rolling-stock, and parts and accessories thereof), 84(Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof), 16(Preparations of meat, of fish or of crustaceans, mollusks or other aquatic invertebrates), and 10(Cereals) according to their highest values of LFI for some years and their average of LFI during the period. Comparing with RCA indices shows that except for product 87(Vehicles other than railway or tramway rolling-stock, and parts and accessories thereof), other four products have also high values of RCA and average of RCA during the period. However, sector 87 had its maximum value of RCA 1.18 in 2010 but in average its RCA has been smaller than 1. Thailand has the most de-specialization in sectors with HS-codes 27(Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes), 72(Iron and steel), 85(Electrical machinery & equipment & parts thereof; sound recorders & reproducers, television image & sound recorders & reproducers), 29(Organic chemicals), and 73(Articles of iron or steel) according to their lowest negative average

LFI during years. In average 50 sectors in Thailand enjoy specialization according to their positive average LFI greater than zero, 23 of which have positive average annual growth in the period. Besides, 23 sectors with negative average LFI also have positive annual growth in average.

In Vietnam sectors with HS-codes 27(Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes), 03(Fish and crustaceans, molluscs and other aquatic invertebrates), 64(Footwear, gaiters and the like; parts of such articles), 62(Articles of apparel and clothing accessories, not knitted or crocheted), and 61(Articles of apparel and clothing accessories, knitted or crocheted) enjoy specialization with highest values of LFI and average LFI during the period. Comparing to RCA indices, Vietnam has CA in all of these products according to their high values of RCA and average RCA. It can be concluded that LFI and RCA measures are showing similar patterns of specialization in Vietnam. Products with HS-codes 84(Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof), 72, 39, 85(Electrical machinery & equipment & parts thereof; sound recorders & reproducers, television image & sound recorders & reproducers), and 87(Vehicles other than railway or tramway rolling-stock, and parts and accessories thereof) are having the lowest specialization according to their lowest values of average LFI during the period. They are also with low values of RCA, which confirms the similarity of LFI and RCA in Vietnam. In 36 sectors, average of LFI during 2000-2010 is greater than zero among which, 17 have been improving according to their positive average annual growth during the period. Among all 96 sectors, 48 enjoyed positive average annual growth of LFI, which is almost half of all sectors.

4.3. Estimation results for RCA

Table 3 shows the GMM estimation results with inclusion of RCA as the main independent variable. Second column of the table from the left shows the estimation results including six major ASEAN members as reporter countries. The rest of the columns to the right represent regression results for each of these members as reporter countries separately. “IDN”, “MYS”, “PHL”, “SGP”, “THA”, and “VNM” are respectively the countries’ acronym for Indonesia, Malaysia, Philippines, Singapore, Thailand, and Vietnam. As it is observed in the post estimation tests in the last three rows, Arellano-Bond test for zero autocorrelation in the first and second order of differences acknowledge the order of lags used in the regressions. In other words, the null hypothesis of no autocorrelation in the first order of differences is rejected for all models, while for the second order of differences it is not rejected. Therefore, first differencing used in the structure of the regression controlled for the first order of autocorrelation. For the model including all countries and the model for Singapore, Sargan test

rejects the validity of instruments, while for the rest of the models over identifying restrictions for validity of instruments have not been rejected at 1 percent level of significance. Various combinations of instruments, lags and differences of variables have been tested to achieve the post estimation tests that are more robust.

TABLE 4.

GMM regression including RCA as main independent variable

	6 members	IDN	MYS	PHL	SGP	THA	VNM
Dependent:	$\ln(Exp_{hrpt})$	$\ln(Exp_{hrpt})$	$\ln(Exp_{hrpt})$	$\ln(Exp_{hrpt})$	$\ln(Exp_{hrpt})$	$\ln(Exp_{hrpt})$	$\ln(Exp_{hrpt})$
L.$\ln(Exp_{hrpt})$	0.26^{***}	0.10^{*}	0.31^{***}	0.022	0.11	0.15^{***}	0.37^{***}
	(0.032)	(0.055)	(0.062)	(0.092)	(0.072)	(0.052)	(0.082)
L2.$\ln(Exp_{hrpt})$	0.074^{***}	0.012	0.069^{**}	−0.040	−0.018	0.034	0.068^{**}
	(0.015)	(0.025)	(0.030)	(0.040)	(0.033)	(0.026)	(0.031)
L3.$\ln(Exp_{hrpt})$	−0.0069	-0.046^{**}	−0.0052	-0.083^{***}	−0.028	−0.022	0.012
	(0.0097)	(0.019)	(0.025)	(0.024)	(0.024)	(0.019)	(0.019)
RCA	0.10^{**}	0.071	0.18^{***}	0.10^{**}	−0.16	0.16	0.031
	(0.044)	(0.069)	(0.046)	(0.040)	(0.24)	(0.10)	(0.023)
L.RCA	-0.11^{***}	0.072	−0.059	−0.047	0.37	−0.077	0.0065
	(0.040)	(0.044)	(0.038)	(0.042)	(0.34)	(0.076)	(0.025)
L2.RCA	−0.025	0.025	0.13^{***}	0.036	−0.25	0.063	0.061^{**}
	(0.057)	(0.053)	(0.048)	(0.035)	(0.22)	(0.100)	(0.027)
$\ln(Y_p)$	3.72^{***}	3.49^{***}	3.04^{***}	4.63	1.02	3.67^{***}	1.57^{*}
	(0.27)	(0.94)	(0.73)	(3.33)	(1.00)	(0.72)	(0.87)
L.$\ln(Y_p)$	-2.20^{***}	-2.44^{**}	-2.27^{**}	−1.86	−1.36	-1.96^{**}	−1.16
	(0.38)	(1.21)	(0.91)	(4.38)	(1.42)	(0.93)	(1.18)
L2.$\ln(Y_p)$	-0.92^{*}	−0.036	−0.49	2.36	2.12	−0.49	−1.21
	(0.54)	(1.41)	(0.99)	(4.62)	(1.81)	(1.17)	(1.56)
L3.$\ln(Y_p)$	−0.39	0.52	0.17	−4.69	−1.40	−0.92	2.11
	(0.43)	(1.06)	(0.80)	(3.00)	(1.55)	(0.91)	(1.48)
$\ln(Y_r)$	0.89^{***}	2.19	2.45^{***}	0.71	1.86^{***}	0.76	0.29
	(0.23)	(1.87)	(0.64)	(2.33)	(0.50)	(0.66)	(2.08)
L.$\ln(Y_r)$	−0.027	-3.86^{*}	-1.18^{**}	−2.09	0.76	1.20^{*}	11.5^{***}
	(0.28)	(2.20)	(0.55)	(1.83)	(0.57)	(0.70)	(2.95)
L2.$\ln(Y_r)$	−0.46	−0.67	−0.16	−1.36	-1.72^{***}	-4.33^{***}	-17.2^{***}
	(0.31)	(0.93)	(0.57)	(2.89)	(0.65)	(1.07)	(4.59)
L3.$\ln(Y_r)$	0.65^{***}	2.43^{***}	−0.22	2.31	−0.33	4.11^{***}	6.73^{**}
	(0.24)	(0.52)	(0.42)	(3.46)	(0.54)	(0.92)	(3.32)
$\ln(P_r - P_p)$	0.035	−0.22	−0.079	−1.33	−0.080	0.011	0.080
	(0.042)	(0.52)	(0.30)	(2.33)	(0.11)	(0.046)	(0.12)
L.$\ln(P_r - P_p)$	0.042	0.15	0.43	0.34	0.033	0.058	0.13
	(0.053)	(0.58)	(0.29)	(2.88)	(0.11)	(0.063)	(0.17)

TABLE 4—*Continued*

	6 members	IDN	MYS	PHL	SGP	THA	VNM
Dependent:	$\ln(Exp_{hrpt})$	$\ln(Exp_{hrpt})$	$\ln(Exp_{hrpt})$	$\ln(Exp_{hrpt})$	$\ln(Exp_{hrpt})$	$\ln(Exp_{hrpt})$	$\ln(Exp_{hrpt})$
L2.$\ln(P_r - P_p)$	-0.053	-0.13	-0.43	-0.78	0.096	-0.046	-0.059
	(0.061)	(0.68)	(0.33)	(3.25)	(0.095)	(0.084)	(0.19)
L3.$\ln(P_r - P_p)$	-0.078^{**}	0.080	-0.077	1.09	-0.030	-0.091	-0.33
	(0.035)	(0.53)	(0.052)	(1.57)	(0.085)	(0.10)	(0.38)
$\ln Exchange$	0.32^{***}	0.47^{***}	0.64^{***}	0.11	-0.072	0.31	0.57^{*}
	(0.083)	(0.17)	(0.21)	(0.36)	(0.24)	(0.20)	(0.31)
L.$\ln Exchange$	-0.052	0.15	-0.59^{**}	0.47	0.69^{**}	0.22	-0.56
	(0.075)	(0.14)	(0.27)	(0.39)	(0.27)	(0.22)	(0.35)
L2.$\ln Exchange$	-0.11^{**}	-0.24^{*}	0.16	-0.26	-0.78^{***}	-0.48^{**}	0.37
	(0.051)	(0.12)	(0.24)	(0.35)	(0.28)	(0.21)	(0.39)
L3.$\ln Exchange$	-0.048	0.14^{*}	0.17	0.37	0.46^{**}	0.28^{*}	-0.59^{*}
	(0.045)	(0.074)	(0.17)	(0.28)	(0.21)	(0.16)	(0.33)
TMW	0.013^{**}	0.0070	0.033^{***}	-0.0081	0.023^{**}	-0.013	0.018
	(0.0055)	(0.011)	(0.011)	(0.022)	(0.011)	(0.012)	(0.017)
L.TMW	-0.0071	-0.0016	-0.0072	-0.019	-0.0079	0.0015	-0.012
	(0.0050)	(0.010)	(0.011)	(0.022)	(0.011)	(0.011)	(0.017)
L2.TMW	0.013^{***}	0.0073	0.013	0.0034	-0.016	0.0050	-0.0051
	(0.0051)	(0.010)	(0.012)	(0.019)	(0.012)	(0.011)	(0.018)
L3.TMW	-0.013^{**}	-0.0054	-0.0036	-0.018	-0.0021	-0.025^{**}	0.0026
	(0.0056)	(0.011)	(0.011)	(0.018)	(0.015)	(0.012)	(0.015)
N	40974	8887	7009	3979	7073	9387	4639
Arellano-Bond, $P > z$ 1^{st} order	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Arellano-Bond, $P > z$ 2^{nd} order	0.618	0.428	0.413	0.148	0.171	0.631	0.373
Sargan test, $P > \chi^2$	0.000	0.167	0.167	0.112	0.001	0.042	0.215

Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Arellano-Bond test for zero autocorrelation in first-differenced errors in GMM two-step regression, H0: no autocorrelation Sargan test of overidentifying restrictions in GMM two-step regression, H_0: overidentifying restrictions are valid Additional instruments: $REER_p$, $\ln(Dist_{rp})$, yr1996-yr2011, RTA, and Cus

RCA coefficient is statistically significant and positive in only three models. In fact, only in Malaysia and Philippines, sectors in which there is higher CA are most probable for higher exportations. In other words, the traditional CA theory only works in these two countries. In the first model covering all 6 major countries, the RCA coefficient is also statistically significant and positive. According to the statistics of the Sargan test, this

regression is biased and its results cannot be accounted as unbiased. However, the positive significant impact of RCA in this model can be mainly due to the existing positive significant effects of RCA in Malaysia and Philippines. If the sectors with CA are supported to improve their CA, the exportation of products from these sectors will also increase in these two countries. As a policy implication of these results, support of the industries with high CA can be suggested in these two countries, while for other four members such suggestion does not have any empirical reasoning behind.

As for the coefficients of the rest of the variables following interpretations can be suggested. Past changes of exportation in each sector does not have statistically significant impacts on the current pattern of export of the products in Philippines and Singapore. A persistency of the changes in the dependent variable is observed in the rest of the models with statistically significant coefficients for the lags of dependent variable.

GDP of the partner countries have statistically significant coefficients in all models except in models of Philippines and Singapore. This means that exportation of products from these two countries has no relationship with the market potential of the destination country. In other words in the context of gravity model, the partner country's market has no significant impact on the attraction of products from these two countries. Since both the dependent variable and GDP are in logs, these results suggest that the elasticity of product exports and GDP of the partners is statistically positive in Indonesia, Malaysia, Thailand, and Vietnam.

The elasticity of product export and GDP of the exporting country is statistically significant and positive in Malaysia, Singapore, and the model for all six members. The values of the coefficient greater than one for these two countries suggest that a one-percentage increase in their domestic GDP can increase the exportation of products more than one percent. This coefficient is statistically insignificant for other four members.

The differences between the real GDP per capita of reporter and partner countries have statistically significant impact on the exports of products from the six ASEAN members and partner countries.

Exchange rate has statistically significant positive coefficients in models for Indonesia, Malaysia, Vietnam and all six-members. This result suggests that when the domestic currency of these three countries depreciates with respect to the partner's currency (partner currency becomes more expensive), the exportation of products from these countries to the partner will increase. The intuition behind is very simple. Because of depreciation of currency of the exporter country, the product will be cheaper in the partner country; thus, the amount of the exporting product demanded in the partner country will increase. However, since the coefficients show the elasticity, the results suggest increase of export lower than one percent with respect to a one percent depreciation of exporter currency.

Tariff rate of most favored nation (TMW) in the partner country statistically significantly increases the export of product from Malaysia, Singapore, and all six members as a whole. This result is surprising as tariffs are restricting trade and TMW should decrease the level of exportation.

4.4. Estimation results for LFI

Table 4 shows the GMM estimation results with inclusion of LFI as the main independent variable. Columns are sorted similarly to table 3 and instruments and lags are included such that the post estimation tests give the results that are most robust. Arellano-Bond test for the models shows similar results to table 3. Moreover, similar to the results of Sargan test in previous table, the validity of over identifying restrictions for the whole sample model and the model for Singapore is rejected. Therefore, the results of the rest of the models are acceptable at 1% level of significance.

TABLE 5.

GMM regression including LFI as main independent variable

	6 members	IDN	MYS	PHL	SGP	THA	VNM
Dependent:	$\ln(Exp_{hrpt})$	$\ln(Exp_{hrpt})$	$\ln(Exp_{hrpt})$	$\ln(Exp_{hrpt})$	$\ln(Exp_{hrpt})$	$\ln(Exp_{hrpt})$	$\ln(Exp_{hrpt})$
L. $\ln(Exp_{hrpt})$	0.26^{***}	0.072	0.37^{***}	0.058	0.12^{*}	0.16^{***}	0.27^{***}
	(0.032)	(0.058)	(0.065)	(0.094)	(0.071)	(0.055)	(0.086)
L2.$\ln(Exp_{hrpt})$	0.072^{***}	-0.0043	0.092^{***}	-0.023	-0.026	0.050^{*}	0.052^{*}
	(0.015)	(0.025)	(0.031)	(0.041)	(0.032)	(0.028)	(0.031)
L3. $\ln(Exp_{hrpt})$	-0.0072	-0.056^{***}	0.0047	-0.074^{***}	-0.034	-0.034^{*}	0.0012
	(0.0097)	(0.018)	(0.025)	(0.024)	(0.024)	(0.019)	(0.019)
LFI	0.36^{***}	0.060	0.13^{**}	0.25^{*}	0.17	-0.076	0.23
	(0.087)	(0.13)	(0.058)	(0.15)	(0.11)	(0.11)	(0.14)
L.LFI	-0.021	0.050	0.080	-0.094	-0.013	-0.072	0.23^{*}
	(0.079)	(0.12)	(0.057)	(0.20)	(0.14)	(0.096)	(0.14)
L2.LFI	0.018	-0.025	0.16^{**}	0.038	-0.076	0.020	0.019
	(0.054)	(0.085)	(0.064)	(0.12)	(0.13)	(0.16)	(0.13)
$\ln(Y_p)$	3.81^{***}	3.47^{***}	3.13^{***}	5.73^{*}	1.08	3.60^{***}	1.79^{**}
	(0.26)	(0.94)	(0.77)	(3.30)	(0.97)	(0.71)	(0.86)
L. $\ln(Y_p)$	-2.40^{***}	-2.40^{**}	-2.34^{**}	-2.89	-0.81	-1.73^{*}	-0.71
	(0.36)	(1.19)	(0.92)	(4.48)	(1.36)	(0.94)	(1.15)
L2. $\ln(Y_p)$	-0.96^{*}	0.16	-0.79	1.66	1.54	-0.68	-1.29
	(0.53)	(1.39)	(1.03)	(4.82)	(1.71)	(1.17)	(1.53)
L3. $\ln(Y_p)$	-0.25	0.53	0.52	-4.45	-1.45	-0.90	1.85
	(0.43)	(1.06)	(0.83)	(3.13)	(1.46)	(0.92)	(1.49)
$\ln(Y_r)$	0.90^{***}	2.16	2.97^{***}	0.87	1.93^{***}	0.92	-0.076
	(0.23)	(1.89)	(0.65)	(2.27)	(0.49)	(0.65)	(2.02)

TABLE 5—*Continued*

	6 members	IDN	MYS	PHL	SGP	THA	VNM
Dependent:	$\ln(Exp_{hrpt})$	$\ln(Exp_{hrpt})$	$\ln(Exp_{hrpt})$	$\ln(Exp_{hrpt})$	$\ln(Exp_{hrpt})$	$\ln(Exp_{hrpt})$	$\ln(Exp_{hrpt})$
L. $\ln(Y_r)$	0.013	-3.91^{*}	-1.51^{***}	-1.89	0.37	0.61	10.8^{***}
	(0.28)	(2.22)	(0.57)	(1.87)	(0.57)	(0.67)	(3.02)
L2. $\ln(Y_r)$	-0.51	-0.80	-0.17	0.70	-1.49^{**}	-3.34^{***}	-14.9^{***}
	(0.31)	(0.94)	(0.56)	(3.02)	(0.64)	(1.00)	(4.50)
L3. $\ln(Y_r)$	0.65^{***}	2.50^{***}	-0.43	0.085	-0.28	3.53^{***}	5.67^{*}
	(0.24)	(0.53)	(0.43)	(3.51)	(0.52)	(0.91)	(3.19)
$\ln(P_r - P_p)$	0.041	-0.19	-0.12	-1.90	-0.066	0.029	0.042
	(0.042)	(0.53)	(0.31)	(2.35)	(0.11)	(0.045)	(0.12)
L. $\ln(P_r - P_p)$	0.042	0.20	0.34	0.62	-0.0091	0.048	0.076
	(0.053)	(0.58)	(0.30)	(2.98)	(0.11)	(0.062)	(0.17)
L2. $\ln(P_r - P_p)$	-0.055	-0.26	-0.32	-0.92	0.11	-0.039	-0.076
	(0.061)	(0.68)	(0.33)	(3.37)	(0.094)	(0.083)	(0.19)
L3. $\ln(P_r - P_p)$	-0.079^{**}	0.12	-0.075	1.44	-0.047	-0.067	-0.41
	(0.036)	(0.52)	(0.052)	(1.65)	(0.082)	(0.10)	(0.35)
$\ln Exchange$	0.31^{***}	0.48^{***}	0.70^{***}	0.17	-0.090	0.40^{**}	0.61^{**}
	(0.083)	(0.17)	(0.22)	(0.36)	(0.24)	(0.20)	(0.31)
L.$\ln Exchange$	-0.017	0.18	-0.61^{**}	0.42	0.66^{**}	0.11	-0.50
	(0.075)	(0.14)	(0.27)	(0.40)	(0.26)	(0.22)	(0.34)
L2.$\ln Exchange$	-0.14^{***}	-0.25^{**}	0.14	-0.25	-0.67^{**}	-0.48^{**}	0.31
	(0.050)	(0.12)	(0.24)	(0.36)	(0.26)	(0.20)	(0.38)
L3.$\ln Exchange$	-0.038	0.15^{**}	0.20	0.34	0.44^{**}	0.36^{**}	-0.50
	(0.044)	(0.074)	(0.17)	(0.29)	(0.21)	(0.15)	(0.34)
TMW	0.012^{**}	0.0069	0.037^{***}	-0.011	0.024^{**}	-0.013	0.016
	(0.0055)	(0.011)	(0.011)	(0.022)	(0.011)	(0.013)	(0.017)
L.TMW	-0.0063	-0.0022	-0.0091	-0.022	-0.011	0.0030	-0.014
	(0.0051)	(0.010)	(0.011)	(0.022)	(0.010)	(0.011)	(0.016)
L2.TMW	0.014^{***}	0.0052	0.020^{*}	0.0088	-0.016	0.0065	-0.0063
	(0.0051)	(0.010)	(0.012)	(0.019)	(0.012)	(0.011)	(0.017)
L3.TMW	-0.014^{**}	-0.0070	-0.0057	-0.015	-0.0032	-0.020^{*}	0.0050
	(0.0056)	(0.011)	(0.011)	(0.018)	(0.014)	(0.011)	(0.015)

As observed, similar to the results for RCA, estimation outcomes of LFI suggest that specialization has statistically significant impact on the exportation of products only in Malaysia, Philippines and the whole sample. Therefore, any policy that supports the specialization of sectors in these two countries that increases value of LFI can potentially increase their exports. According to the regression results for other members, this cannot

TABLE 5—*Continued*

	6 members	IDN	MYS	PHL	SGP	THA	VNM
Dependent:	$\ln(Exp_{hrpt})$	$\ln(Exp_{hrpt})$	$\ln(Exp_{hrpt})$	$\ln(Exp_{hrpt})$	$\ln(Exp_{hrpt})$	$\ln(Exp_{hrpt})$	$\ln(Exp_{hrpt})$
N	40974	8887	7009	3979	7073	9387	4639
Arellano-Bond, $P > z$ 1^{st} order	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Arellano-Bond, $P > z$ 2^{nd} order	0.848	0.406	0.457	0.158	0.121	0.225	0.553
Sargan test, $P > \chi^2$	0.000	0.082	0.161	0.085	0.001	0.061	0.143

Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Arellano-Bond test for zero autocorrelation in first-differenced errors in GMM two-step regression, H_0: no autocorrelation Sargan test of overidentifying restrictions in GMM two-step regression, H0: overidentifying restrictions are valid Additional instruments: $REER_p$, $\ln(Dist_{rp})$, yr1996-yr2011, RTA, and Cus

be suggested for them since specialization has no statistically significant impact on the exportation of products.

Again GDP of the partner countries cannot statistically significantly affect the exportation of products in Singapore. Unlike results of table 3, table 4 suggests that GDP of partner countries can increase exportation of products from Philippines at 10 percent level of significance. Moreover, similar to table 1 other models have statistically significant coefficients for the GDP of partner countries.

Results of the coefficients for GDP of the reporter country, TMW of partner country, and the differences in the GDP per capita of reporter and partner countries in table 4 are similar to the ones in table 3. Exchange rate has also similar results in both tables except for Thailand. Depreciation of domestic currency in Thailand with respect to partner's currency increases the exportation of products according to the statistically positive significant coefficient of LnExchange in table 4.

5. CONCLUSION

In this paper, we tried to shed light on the concept of Comparative Advantage. Theories and discussions on the issue since Ricardo have been briefly discussed. Two major and important indices in the literature measuring CA and specialization have been explained. The focus of this research was to find patterns of CA and analyze the impact of CA on the exports of products in ASEAN countries. It was mainly tried to see whether or not these countries are following Ricardian theory of CA. Indonesia, Malaysia, Philippines, Singapore, Thailand and Vietnam are the major

ASEAN members at the focus of the analysis. RCA introduced by Balassa (1965) and LFI introduced by Lafay (1992) have been calculated for 96 products at two-digit level of Harmonized System (revision 1996) in these six major countries. The values of these two indices are almost showing similar sectors as being specialized or de-specialized. According to RCA, sectors with HS-codes 80, 15, 14, 40, 44, and 46 are with highest CA in most of ASEAN countries. LFI indices show that, industries with HS-codes 27, 15, 44, 85, 40, 84, and 62 are commonly with highest specialization in most of the six major countries of ASEAN. The results suggest that both measures of RCA and LFI are similar proxies measuring CA introduced by Ricardian followers.

In the econometrics analysis it was tried to find the effectiveness of Ricardian CA and specialization on the exports of industries. Dual causality between CA indices and export is the most important problem in the analysis. In order to control for problems of the panel database such as endogeneity, heteroscedasticity, time and specific fixed effects, robust two-step GMM technique was used to estimate a gravity model including CA and specialization indices as main independent variables. The results of the econometric analysis suggested that CA and specialization of sectors increase the level of export of the industry only in Malaysia and Philippines. Both RCA and LFI get statistical significant positive coefficients only in the model for these two countries. Again, these equivalent results determine the similarity of the two measures. Moreover, outcomes suggest that in other four countries, CA and specialization cannot enhance the export of products. In other words, Ricardian classical CA theory applies to Malaysia and Philippines. This result shows the heterogeneity of ASEAN countries even in the trends of exportation and CA.

As policy implications of this paper, it can be suggested that ASEAN members should not necessarily have common support strategies for their home industries. Econometrics results along with Ricardian CA theory suggest that in Malaysia and Philippines comparative advantage based strategies for the development of domestic industries has a significant impact on exports, while in other four countries it cannot be suggested. Because the empirical evidence does not show any statistically significant linkages between CA or LFI and the export dynamics in four other countries, support strategies of the industries should not necessarily follow the same obligations as in Philippines and Malaysia. In Indonesia, Singapore, Thailand, and Vietnam the strategies for development of sectors and their exports can follow different basis other than CA oriented ones. Further extensions to this research can be testing other theories of international trade in ASEAN members. Neoclassical theory proposed by Hechscher-Ohlin, neotechnology theory described by Posner (1961), and intra industry trade described by Grubel et al. (1975) and Helpman (1981) should be tested

for these Southeast Asian countries. In fact, since Ricardian CA theory is only explained in trade patterns of Philippines and Malaysia, it would be interesting to check applicability of other theories within these countries.

APPENDIX A

Harmonized System Codes revision 1996 at two-levels:

HS Code 01 Live animals
HS Code 02 Meat and edible meat offal
HS Code 03 Fish and crustaceans, molluscs and other aquatic invertebrates
HS Code 04 Dairy produce; birds' eggs; natural honey; edible products of animal origin, not elsewhere specified or included
HS Code 05 Products of animal origin, not elsewhere specified or included
HS Code 06 Live trees and other plants; bulbs, roots and the like; cut flowers and ornamental foliage
HS Code 07 Edible vegetables and certain roots and tubers
HS Code 08 Edible fruit and nuts; peel of citrus fruit or melons
HS Code 09 Coffee, tea, mate and spices
HS Code 10 Cereals
HS Code 11 Products of the milling industry; malt; starches; inulin; wheat gluten
HS Code 12 Oil seeds & oleaginous fruits; miscellaneous grains, seeds & fruit; industrial or medicinal plants; straw & fodder
HS Code 13 Lac; gums resins and other vegetable saps and extracts
HS Code 14 Vegetable plaiting materials; vegetable products not elsewhere specified or included
HS Code 15 Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes
HS Code 16 Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates
HS Code 17 Sugars and sugar confectionery
HS Code 18 Cocoa and cocoa preparations
HS Code 19 Preparations of cereals, flour, starch or milk; pastry cooks' products
HS Code 20 Preparations of vegetables, fruit, nuts or other parts of plants
HS Code 21 Miscellaneous edible preparations
HS Code 22 Beverages, spirits and vinegar
HS Code 23 Residues and waste from the food industries; prepared animal fodder
HS Code 24 Tobacco and manufactured tobacco substitutesHS Code 25 Salt; sulphur; earths and stone; plastering materials, lime and cement
HS Code 26 Ores, slag and ash

HS Code 27 Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes
HS Code 28 Inorganic chemicals; organic or inorganic compounds of precious metals, of rare-earth metals of radioactive elements or of isotopes
HS Code 29 Organic chemicals
HS Code 30 Pharmaceutical products
HS Code 31 Fertilizers
HS Code 32 Tanning or dyeing extracts; tannins & their derivatives; dyes, pigments & other coloring matter; paints & varnishes; putty & other mastics; inks
HS Code 33 Essential oils and resinoids; perfumery, cosmetic or toilet preparations
HS Code 34 Washing preparations, lubricating preparations, artificial waxes, modelling pastes, etc.
HS Code 35 Albuminoidal substances; modified starches; glues; enzymes
HS Code 36 Explosives; pyrotechnic products; matches; pyrophoric alloys; certain combustible preparations
HS Code 37 Photographic or cinematographic goods
HS Code 38 Miscellaneous chemical products
HS Code 39 Plastics and articles thereof
HS Code 40 Rubber and articles thereof
HS Code 41 Raw hides and skins (other than fur skins)
HS Code 42 Articles of leather; saddlery & harness; travel goods, handbag & similar containers; articles of animal gut
HS Code 43 Fur skins and artificial fur; manufactures thereof
HS Code 44 Wood and articles of wood; wood charcoal
HS Code 45 Cork and articles of cork
HS Code 46 Manufactures of straw, of esparto or of other plaiting materials; basket ware and wickerwork
HS Code 47 Pulp of wood or of other fibrous cellulosic material; recovered paper or paperboard; paper & paperboard & articles thereof
HS Code 48 Paper and paperboard; articles of paper pulp, of paper or of paperboard
HS Code 49 Printed books, newspapers, pictures & other products of the printing industry; manuscripts, typescripts & plans
HS Code 50 Silk
HS Code 51 Wool, fine or coarse animal hair; horsehair yarn and woven fabric
HS Code 52 Cotton
HS Code 53 Other vegetable textile fibers; paper yarn and woven fabrics of paper yarn
HS Code 54 Man-made filaments
HS Code 55 Man-made staple fibers

HS Code 56 Wadding, felt and nonwovens; special yarns; twine, cordage, ropes and cables and articles thereof
HS Code 57 Carpets and other textile floor coverings
HS Code 58 Special woven fabrics; tufted textile fabrics; lace; tapestries; trimmings; embroidery
HS Code 59 Impregnated, coated, covered or laminated textile fabrics; textile articles for industrial use
HS Code 60 Knitted or crocheted fabrics
HS Code 61 Articles of apparel and clothing accessories, knitted or crocheted
HS Code 62 Articles of apparel and clothing accessories, not knitted or crocheted
HS Code 63 Other made up textile articles; sets; worn clothing and worn textile articles; rags
HS Code 64 Footwear, gaiters and the like; parts of such articles
HS Code 65 Headgear and parts thereof
HS Code 66 Umbrellas, sun umbrellas, walking-sticks, seat-sticks, whips, riding-crops and parts thereof
HS Code 67 Prepared feathers & down & articles made of feathers or of down; artificial flowers; articles of human hair
HS Code 68 Articles of stone, plaster, cement, asbestos, mica or similar materials
HS Code 69 Ceramic products
HS Code 70 Glass and glassware
HS Code 71 Pearls, precious or semi-precious stones, etc, & articles thereof; imitation jewelry; coin
HS Code 72 Iron and steel
HS Code 73 Articles of iron or steel
HS Code 74 Copper and articles thereof
HS Code 75 Nickel and articles thereof
HS Code 76 Aluminum and articles thereof
HS Code 78 Lead and articles thereof
HS Code 79 Zinc and articles thereof
HS Code 80 Tin and articles thereof
HS Code 81 Other base metals; cermets; articles thereof
HS Code 82 Tools, implements, cutlery, spoons and forks, of base metal; parts thereof of base metal
HS Code 83 Miscellaneous articles of base metal
HS Code 84 Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof
HS Code 85 Electrical machinery & equipment & parts thereof; sound recorders & reproducers, television image & sound recorders & reproducers

HS Code 86 Railway or tramway locomotives, rolling-stock & parts thereof; track fixtures fittings & parts thereof; mechanical traffic signaling equipment
HS Code 87 Vehicles other than railway or tramway rolling-stock, and parts and accessories thereof
HS Code 88 Aircraft, spacecraft, and parts thereof
HS Code 89 Ships, boats and floating structures
HS Code 90 Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments & apparatus; parts & accessories thereof
HS Code 91 Clocks and watches and parts thereof
HS Code 92 Musical instruments; parts and accessories of such articles
HS Code 93 Arms and ammunition; parts and accessories thereof
HS Code 94 Furniture; bedding & similar stuffed furnishings; lamps & lighting fittings; illuminated signs, illuminated name-plates & the like; prefabricated buildings
HS Code 95 Toys, games and sports requisites; parts and accessories thereof
HS Code 96 Miscellaneous manufactured articles
HS Code 97 Works of art, collectors' pieces and antiques

APPENDIX B

RCA Indices

TABLE 6.

Indonesian RCA for 96 products at 2-digit HS 1996 during 1996-2011

HSCode	Year	Max	Mean	Change	Growth	HSCode	Year	Max	Mean	Change	Growth
1	2001	0.48	0.30	0.03	0.04	49	2006	0.15	0.10	0.03	0.08
2	1998	0.06	0.03	−0.02	−0.01	50	2004	0.45	0.10	−0.18	0.63
3	1998	5.52	3.70	−2.48	−0.04	51	1997	0.10	0.05	−0.03	0.25
4	2001	0.52	0.29	0.19	0.15	52	1999	3.02	2.07	−0.97	−0.04
5	2001	0.20	0.13	−0.03	0.05	53	2011	0.39	0.13	0.31	0.26
6	2003	0.14	0.09	0.03	0.34	54	1999	4.59	3.59	−0.57	−0.01
7	1996	0.40	0.22	−0.26	−0.05	55	2010	6.05	4.87	1.85	0.03
8	1999	0.60	0.47	0.06	0.02	56	2008	0.67	0.48	0.17	0.04
9	1996	8.86	5.20	−5.62	−0.05	57	1999	0.44	0.34	0.12	0.06
10	1998	0.23	0.04	0.00	0.56	58	2000	1.34	0.66	−0.40	−0.03
11	2004	0.80	0.35	0.11	0.27	59	1999	1.11	0.80	−0.38	−0.03
12	2006	0.38	0.25	0.09	0.05	60	2004	0.74	0.43	−0.13	0.02
13	2007	1.87	1.08	−0.86	−0.02	61	2001	2.35	1.85	−0.29	0.00
14	2004	12.66	7.52	3.35	0.08	62	2001	3.21	2.61	−0.69	−0.02
15	2008	20.01	13.18	9.64	0.08	63	2001	1.51	0.87	−0.88	−0.05

TABLE 6—*Continued*

HSCode	Year	Max	Mean	Change	Growth	HSCode	Year	Max	Mean	Change	Growth
16	2009	1.65	1.11	0.74	0.08	64	1996	5.37	3.25	−2.70	−0.04
17	2008	0.54	0.42	−0.12	0.03	65	2001	1.37	0.86	−0.53	−0.03
18	2002	6.08	3.95	−0.47	0.03	66	1999	2.47	1.19	−1.14	−0.10
19	2010	0.78	0.55	0.39	0.09	67	2007	4.87	3.84	1.29	0.05
20	1996	0.84	0.55	−0.47	0.04	68	2001	0.59	0.40	0.04	0.05
21	2011	0.76	0.35	0.63	0.15	69	2004	1.06	0.78	0.14	0.03
22	2011	0.11	0.06	0.06	0.08	70	2000	1.05	0.81	−0.28	0.00
23	1996	0.96	0.64	−0.31	0.00	71	1998	2.71	0.59	−0.26	0.09
24	2010	1.75	1.35	0.57	0.05	72	1998	0.58	0.32	−0.02	0.04
25	2001	1.86	1.01	−0.53	−0.02	73	2010	0.52	0.44	0.21	0.06
26	1996	11.11	6.49	−8.48	−0.06	74	2009	2.25	1.42	1.47	0.27
27	1996	4.91	2.88	−2.68	−0.04	75	2007	6.46	3.56	−0.01	3.43
28	2005	0.69	0.47	0.08	0.05	76	1996	0.78	0.63	−0.35	−0.03
29	2007	0.83	0.62	0.37	0.07	78	1996	0.73	0.23	−0.54	0.14
30	1999	0.08	0.05	0.01	0.02	79	2002	0.12	0.07	−0.02	0.04
31	1997	2.29	1.00	−1.39	0.48	80	2008	35.22	23.66	0.23	0.02
32	2007	0.43	0.32	0.08	0.03	81	2004	0.05	0.02	0.02	0.38
33	1998	0.48	0.37	0.16	0.04	82	1998	0.41	0.21	−0.16	−0.04
34	2008	1.33	1.10	0.49	0.05	83	2010	0.42	0.26	0.26	0.10
35	2006	0.20	0.13	0.08	0.07	84	2000	0.39	0.28	0.08	0.05
36	1999	0.67	0.41	−0.10	0.07	85	2002	0.78	0.59	−0.04	0.00
37	1998	0.05	0.02	−0.01	0.10	86	1996	0.61	0.17	−0.56	0.18
38	2011	1.57	0.77	1.01	0.16	87	2008	0.24	0.14	0.15	0.10
39	2000	0.61	0.49	0.01	0.01	88	2009	0.15	0.06	0.07	0.32
40	2008	5.45	3.95	1.04	0.03	89	1998	1.02	0.42	0.05	0.39
41	2007	0.71	0.46	0.18	0.11	90	1997	0.21	0.14	−0.04	0.00
42	2001	1.60	0.86	−0.82	−0.06	91	1997	0.38	0.08	−0.35	−0.05
43	2007	0.04	0.02	0.00	0.17	92	2004	8.26	5.89	4.06	0.09
44	1996	8.33	4.58	−5.99	−0.08	93	1999	0.06	0.03	0.02	0.47
45	2001	0.15	0.03	0.00	0.14	94	2002	1.98	1.50	−0.71	0.03
46	1999	8.57	4.83	−3.80	0.04	95	1996	1.33	0.59	−0.94	−0.02
47	1998	4.70	3.41	0.19	0.04	96	2003	1.02	0.89	0.06	0.01
48	2008	2.20	1.89	0.85	0.06	97	1998	0.08	0.05	0.03	0.15

Shaded cells are the 5 maximum values in each column (Max, Mean, Change, and Growth). Year is the year of the maximum RCA of the product in the period. Mean is the average of RCA in the period. Change is the change of RCA from 1996 to 2011. Growth is the average annual growth of RCA during the period.

TABLE 7.

Malaysian RCA of 96 products at 2-digit HS 1996 during 1997-2011

HSCode	Year	Max	Mean	Change	Growth	HSCode	Year	Max	Mean	Change	Growth
1	1997	1.48	0.78	−0.75	−0.03	49	2008	0.51	0.30	0.18	0.07
2	1997	0.04	0.02	−0.02	0.02	50	2010	0.08	0.03	−0.02	0.26
3	2008	0.83	0.58	0.20	0.04	51	1997	0.59	0.29	−0.30	−0.03
4	2008	0.48	0.28	0.05	0.03	52	2011	0.56	0.33	0.14	0.06
5	2000	0.13	0.09	0.00	0.03	53	2009	0.16	0.04	0.09	0.71
6	2011	0.51	0.26	0.39	0.12	54	2005	1.45	1.22	0.08	0.01
7	2008	0.26	0.20	0.06	0.04	55	1998	0.87	0.64	−0.12	−0.01
8	2001	0.25	0.16	−0.11	−0.04	56	2008	0.61	0.38	0.41	0.12
9	2000	0.49	0.31	−0.19	−0.03	57	2007	0.22	0.11	0.03	0.09
10	1998	0.01	0.01	0.00	0.03	58	2010	0.21	0.15	0.05	0.05
11	1999	0.50	0.38	−0.10	−0.01	59	2011	0.20	0.13	0.08	0.05
12	1999	0.10	0.06	−0.01	0.01	60	1997	0.97	0.58	−0.54	−0.04
13	2008	0.15	0.05	0.04	0.21	61	1998	0.73	0.53	−0.38	−0.05
14	2011	5.74	1.86	3.46	0.38	62	1998	0.43	0.29	−0.22	−0.04
15	2008	16.43	12.89	5.10	0.04	63	2008	0.24	0.18	0.02	0.02
16	1997	0.56	0.37	−0.25	−0.03	64	2004	0.30	0.17	0.00	0.03
17	2007	0.51	0.39	0.13	0.04	65	1997	0.60	0.34	−0.37	−0.06
18	2008	2.58	1.63	0.93	0.05	66	1997	0.23	0.06	−0.22	−0.10
19	2011	1.25	0.84	0.60	0.05	67	2004	0.07	0.02	−0.04	0.00
20	2010	0.21	0.16	0.04	0.02	68	2011	0.62	0.40	0.25	0.04
21	2011	1.19	0.67	0.81	0.09	69	1997	0.60	0.49	−0.13	−0.01
22	2011	0.42	0.25	0.26	0.08	70	2011	1.26	0.79	0.64	0.07
23	2008	0.62	0.41	0.21	0.06	71	2008	0.67	0.47	0.00	0.01
24	2008	0.81	0.63	0.17	0.03	72	2007	0.41	0.28	0.18	0.07
25	2009	1.09	0.55	0.75	0.13	73	2009	0.80	0.65	0.14	0.03
26	1997	0.15	0.07	−0.05	0.05	74	1999	0.90	0.77	−0.02	0.01
27	1997	1.29	1.14	−0.12	0.00	75	2010	0.08	0.04	0.02	0.18
28	2008	0.39	0.25	0.23	0.09	76	2011	0.85	0.49	0.53	0.08
29	2008	0.77	0.52	0.48	0.09	78	2001	1.63	1.01	1.15	0.16
30	1997	0.05	0.03	−0.03	−0.04	79	2009	1.45	0.50	0.83	0.25
31	2009	0.95	0.65	0.28	0.06	80	2011	10.93	6.90	2.85	0.07
32	2009	0.59	0.43	0.30	0.06	81	2011	0.45	0.11	0.43	0.56
33	2008	0.23	0.16	0.08	0.04	82	2009	0.46	0.30	0.24	0.07
34	2008	1.31	0.94	0.42	0.04	83	2008	0.43	0.32	0.14	0.04
35	2011	0.31	0.21	0.14	0.05	84	2000	1.49	1.28	−0.20	−0.01

TABLE 7—*Continued*

HSCode	Year	Max	Mean	Change	Growth	HSCode	Year	Max	Mean	Change	Growth
36	2009	0.36	0.20	0.10	0.06	85	2003	2.89	2.53	−0.41	0.00
37	2011	0.51	0.33	0.41	0.14	86	2008	0.64	0.19	−0.23	0.84
38	2008	1.52	1.30	0.14	0.01	87	2009	0.10	0.06	0.03	0.04
39	2008	1.04	0.76	0.44	0.05	88	1998	0.67	0.29	−0.20	0.05
40	2008	3.49	2.70	0.38	0.02	89	2006	0.73	0.32	−0.50	0.21
41	1998	0.34	0.10	−0.12	0.00	90	2008	0.84	0.65	0.35	0.05
42	1997	0.17	0.10	−0.11	−0.06	91	1997	1.04	0.64	−0.47	−0.02
43	2011	0.08	0.04	0.01	0.20	92	2001	2.46	1.07	0.02	0.06
44	1997	4.27	3.11	−1.47	−0.03	93	2001	0.14	0.03	0.01	0.83
45	1998	0.03	0.01	−0.01	2.51	94	1997	1.34	1.21	−0.23	−0.01
46	1997	0.22	0.05	−0.19	0.09	95	1998	0.70	0.44	−0.38	−0.05
47	2006	0.02	0.01	0.01	0.41	96	2005	0.74	0.61	0.07	0.01
48	2011	0.40	0.27	0.22	0.06	97	1998	0.03	0.02	0.00	0.10

Shaded cells are the 5 maximum values in each column (Max, Mean, Change, and Growth). Year is the year of the maximum RCA of the product in the period. Mean is the average of RCA in the period Change is the change of RCA from 1997 to 2011 Growth is the average annual growth of RCA during the period

TABLE 8.

Philippines RCA of 96 products at 2-digit HS 1996 during 2000-2011

HSCode	Year	Max	Mean	Change	Growth	HSCode	Year	Max	Mean	Change	Growth
1	2011	0.12	0.06	0.09	0.34	49	2007	0.27	0.12	0.08	0.39
2	2011	0.17	0.04	0.17	6.62	50	2008	0.09	0.07	−0.03	0.01
3	2011	1.93	1.31	0.53	0.04	51	2000	0.11	0.03	−0.06	26.40
4	2011	0.87	0.43	0.80	0.32	52	2005	0.28	0.12	−0.03	0.05
5	2004	0.24	0.15	0.07	0.12	53	2008	2.67	1.34	1.12	0.13
6	2011	0.08	0.04	0.05	0.13	54	2000	0.27	0.16	−0.18	0.19
7	2003	0.23	0.18	−0.02	0.03	55	2011	0.42	0.31	0.15	0.07
8	2011	5.28	3.14	2.57	0.11	56	2002	0.83	0.65	0.09	0.05
9	2004	0.10	0.02	0.02	0.85	57	2004	0.12	0.10	0.00	0.03
10	2006	1.19	0.10	0.01	104.75	58	2011	1.36	0.85	0.83	0.12
11	2011	0.26	0.11	0.22	0.32	59	2011	0.12	0.02	0.12	0.86
12	2000	0.42	0.27	−0.07	0.07	60	2001	0.35	0.16	−0.19	−0.07
13	2011	9.36	4.37	6.47	0.14	61	2006	2.36	1.83	0.10	0.02
14	2011	1.59	0.50	1.27	0.26	62	2001	3.09	2.29	−1.25	−0.05
15	2011	6.04	3.76	2.23	0.08	63	2000	0.96	0.53	−0.52	−0.06
16	2011	3.17	1.77	2.34	0.16	64	2001	0.31	0.14	−0.24	−0.06

TABLE 8—*Continued*

HSCode	Year	Max	Mean	Change	Growth	HSCode	Year	Max	Mean	Change	Growth
17	2011	4.03	1.28	3.11	0.44	65	2000	2.03	0.90	−1.48	−0.05
18	2002	0.17	0.09	−0.07	−0.03	66	2011	1.39	0.28	1.35	7.77
19	2011	1.01	0.61	0.64	0.12	67	2011	3.32	2.35	1.32	0.08
20	2011	3.38	2.03	1.82	0.10	68	2011	0.56	0.30	0.41	0.15
21	2011	0.80	0.49	0.35	0.07	69	2006	1.26	0.43	−0.38	0.05
22	2011	0.26	0.15	0.21	0.23	70	2006	1.90	0.62	0.00	0.20
23	2011	0.43	0.33	0.17	0.07	71	2011	0.56	0.32	0.29	0.16
24	2011	3.68	1.31	3.39	0.30	72	2006	0.27	0.15	0.11	0.18
25	2006	0.63	0.46	0.00	0.05	73	2011	0.48	0.20	0.33	0.14
26	2007	2.05	1.32	0.67	0.07	74	2008	3.47	2.13	1.99	0.15
27	2011	0.24	0.17	0.10	0.09	75	2011	0.01	0.00	0.00	3.13
28	2011	1.83	0.59	1.68	0.44	76	2011	0.15	0.10	0.04	0.05
29	2011	0.41	0.11	0.38	0.38	78	2011	0.52	0.18	0.51	0.88
30	2011	0.04	0.03	0.02	0.08	79	2001	0.10	0.06	0.04	0.16
31	2011	1.18	0.66	0.68	0.23	80	2011	2.13	0.78	1.87	0.38
32	2009	0.10	0.08	0.02	0.07	81	2004	2.27	0.99	−0.47	0.07
33	2011	0.45	0.20	0.37	0.18	82	2003	0.12	0.08	−0.03	0.09
34	2011	1.51	0.51	1.32	0.22	83	2011	0.81	0.37	0.49	0.12
35	2011	0.22	0.09	0.12	0.13	84	2009	1.65	1.39	−0.23	−0.01
36	2009	0.81	0.50	−0.05	0.11	85	2003	3.84	3.54	−0.72	−0.02
37	2010	0.05	0.01	0.03	0.77	86	2003	0.33	0.06	−0.01	29.73
38	2011	0.27	0.21	0.09	0.08	87	2011	0.72	0.39	0.55	0.16
39	2011	0.36	0.22	0.19	0.08	88	2009	0.57	0.28	−0.01	0.79
40	2011	0.83	0.46	0.57	0.12	89	2011	1.51	0.40	1.25	0.61
41	2011	0.06	0.04	0.03	0.13	90	2009	0.87	0.62	0.25	0.09
42	2001	2.96	1.39	−2.20	−0.12	91	2001	1.94	1.13	−1.88	−0.21
43	2011	0.25	0.08	0.20	0.58	92	2000	0.09	0.05	−0.03	0.17
44	2011	6.52	1.72	5.88	0.39	93	2011	1.07	0.37	0.91	0.24
45	2008	0.08	0.01	0.00	4.23	94	2000	0.86	0.56	−0.40	−0.04
46	2000	16.98	10.96	−6.71	−0.01	95	2011	0.93	0.63	0.16	0.03
47	2011	1.12	0.46	0.88	0.18	96	2011	0.93	0.56	0.45	0.09
48	2011	0.40	0.20	0.26	0.12	97	2009	0.10	0.03	0.01	0.45

Shaded cells are the 5 maximum values in each column (Max, Mean, Change, and Growth). Year is the year of the maximum RCA of the product in the period. Mean is the average of RCA in the period Change is the change of RCA from 2000 to 2011 Growth is the average annual growth of RCA during the period.

TABLE 9.

Singaporean RCA of 96 products at 2-digit HS 1996 during 1997-2011

HSCode	Year	Max	Mean	Change	Growth	HSCode	Year	Max	Mean	Change	Growth
1	1998	0.05	0.03	−0.02	−0.04	49	2011	1.80	1.02	0.92	0.07
2	2003	0.03	0.02	0.01	0.18	50	1997	0.85	0.36	−0.75	−0.06
3	1997	0.60	0.33	−0.42	−0.08	51	2009	0.05	0.02	0.01	0.24
4	2002	0.29	0.21	0.06	0.04	52	1997	0.25	0.13	−0.21	−0.11
5	2005	0.26	0.15	0.03	0.08	53	1997	0.04	0.02	−0.03	0.09
6	1997	0.18	0.12	−0.08	−0.04	54	2002	0.40	0.27	−0.05	−0.01
7	1997	0.20	0.07	−0.17	−0.12	55	1997	0.77	0.37	−0.58	−0.09
8	1997	0.22	0.11	−0.12	−0.04	56	1997	0.19	0.16	−0.03	0.00
9	2000	1.09	0.65	−0.39	0.04	57	1997	0.11	0.08	−0.04	0.00
10	2003	0.03	0.01	0.02	0.55	58	2005	0.36	0.25	0.02	0.02
11	1997	0.19	0.14	−0.08	−0.03	59	1997	0.26	0.21	−0.07	−0.01
12	1997	0.19	0.11	−0.13	−0.07	60	1997	0.72	0.41	−0.55	−0.09
13	1997	0.48	0.33	−0.33	−0.07	61	2001	0.84	0.55	−0.45	−0.08
14	1997	4.44	1.99	−3.70	−0.10	62	2000	0.27	0.18	−0.09	−0.03
15	1999	0.55	0.41	−0.29	−0.05	63	1997	0.31	0.17	−0.21	−0.07
16	2003	0.15	0.11	−0.04	−0.01	64	1997	0.18	0.14	−0.06	−0.02
17	2008	0.28	0.16	0.11	0.09	65	1997	0.16	0.08	−0.09	−0.04
18	1998	0.85	0.71	0.01	0.01	66	1997	0.19	0.07	−0.17	−0.08
19	2011	0.90	0.55	0.45	0.06	67	1997	0.18	0.06	−0.17	−0.11
20	1997	0.19	0.13	−0.10	−0.05	68	1997	0.19	0.12	−0.08	−0.03
21	2001	0.69	0.55	0.09	0.02	69	1997	0.09	0.05	−0.02	0.02
22	2011	0.87	0.57	0.29	0.04	70	1997	0.49	0.34	−0.01	0.03
23	2003	0.17	0.14	0.07	0.05	71	1998	1.16	0.65	−0.32	0.02
24	1998	2.45	1.18	−1.46	−0.06	72	2009	0.26	0.20	0.05	0.02
25	2008	0.11	0.07	−0.02	0.01	73	2008	0.50	0.40	0.01	0.01
26	2001	0.14	0.04	−0.03	−0.02	74	1997	0.89	0.49	−0.55	−0.05
27	1998	1.57	1.15	0.01	0.01	75	2010	1.11	0.57	0.33	0.09
28	2003	0.22	0.19	0.02	0.01	76	2007	0.45	0.30	−0.09	0.00
29	2003	2.17	1.61	1.20	0.08	78	2001	1.76	1.07	−0.14	0.11
30	2007	0.63	0.30	0.35	0.18	79	1998	1.32	0.73	−0.86	0.02
31	1999	0.05	0.03	−0.03	0.00	80	2004	8.39	6.86	−0.01	0.01
32	2000	1.32	0.96	0.07	0.02	81	2004	0.37	0.27	−0.15	0.00
33	2011	1.66	0.98	0.87	0.06	82	2009	1.07	0.82	0.16	0.02
34	2011	0.55	0.45	0.11	0.02	83	2008	0.71	0.43	−0.11	0.00
35	2002	0.51	0.41	0.02	0.01	84	1997	2.07	1.57	−0.90	−0.04

TABLE 9—*Continued*

HSCode	Year	Max	Mean	Change	Growth	HSCode	Year	Max	Mean	Change	Growth
36	2003	0.50	0.37	0.21	0.07	85	2007	3.11	2.82	0.39	0.01
37	2001	2.26	1.49	−0.43	−0.01	86	2004	0.03	0.02	0.00	0.06
38	2009	1.06	0.93	0.28	0.03	87	2009	0.18	0.12	0.05	0.04
39	2011	1.10	0.85	0.49	0.04	88	2011	1.21	0.56	0.92	0.13
40	1997	0.58	0.44	−0.24	−0.04	89	2011	1.35	0.61	0.67	0.20
41	2000	0.31	0.24	0.04	0.04	90	2002	0.97	0.83	0.25	0.03
42	2009	0.43	0.24	0.19	0.07	91	1997	2.40	1.76	−0.66	−0.02
43	2001	0.01	0.01	0.00	0.19	92	1998	0.75	0.42	−0.35	−0.03
44	1997	0.21	0.12	−0.15	−0.08	93	2007	0.13	0.03	0.02	9.93
45	1998	0.06	0.02	0.00	0.24	94	1997	0.18	0.10	−0.07	−0.02
46	1997	0.09	0.04	−0.06	−0.06	95	2011	0.49	0.35	0.17	0.04
47	1998	0.40	0.18	0.14	0.35	96	1997	0.59	0.48	−0.27	−0.03
48	2011	0.35	0.24	0.14	0.04	97	2008	0.73	0.24	0.31	0.26

Shaded cells are the 5 maximum values in each column (Max, Mean, Change, and Growth). Year is the year of the maximum RCA of the product in the period. Mean is the average of RCA in the period. Change is the change of RCA from 1997 to 2011 Growth is the average annual growth of RCA during the period.

TABLE 10.

Thai RCA of 96 products at 2-digit HS 1996 during 1999-2011

HSCode	Year	Max	Mean	Change	Growth	HSCode	Year	Max	Mean	Change	Growth
1	2009	0.52	0.26	0.05	0.26	49	2011	5.72	1.33	5.58	0.68
2	2001	1.39	0.51	−0.92	0.00	50	2000	1.22	0.78	−0.88	−0.09
3	2000	5.52	3.69	−2.59	−0.05	51	2003	0.56	0.41	−0.20	−0.02
4	2002	0.47	0.24	0.05	0.08	52	1999	1.30	1.11	−0.40	−0.03
5	2001	0.85	0.53	−0.48	−0.05	53	2009	0.48	0.27	0.22	0.10
6	2002	0.63	0.49	0.02	0.01	54	2005	1.52	1.38	0.10	0.01
7	1999	1.94	1.56	−0.32	0.00	55	2005	3.40	3.08	0.33	0.01
8	2011	0.93	0.68	0.34	0.06	56	2005	1.57	1.28	0.17	0.02
9	2000	0.44	0.20	−0.24	−0.08	57	2008	1.06	0.78	0.32	0.05
10	2004	6.16	4.92	−0.95	−0.01	58	2011	1.42	1.27	0.17	0.02
11	2010	4.57	3.29	1.58	0.05	59	2005	0.81	0.67	−0.21	−0.03
12	2004	0.32	0.18	−0.13	0.01	60	2005	0.84	0.68	0.22	0.04
13	2000	0.92	0.57	−0.58	−0.07	61	2000	2.30	1.56	−1.40	−0.07
14	2004	1.72	1.05	−0.78	−0.05	62	2001	1.54	1.04	−0.99	−0.08
15	2008	0.64	0.44	0.23	0.10	63	2001	1.08	0.79	−0.49	−0.05
16	2000	15.47	13.39	−1.56	−0.01	64	1999	2.05	1.30	−1.39	−0.09

TABLE 10—*Continued*

HSCode	Year	Max	Mean	Change	Growth	HSCode	Year	Max	Mean	Change	Growth
17	2011	5.78	4.35	1.87	0.06	65	2000	1.43	1.04	−0.79	−0.06
18	2003	0.24	0.17	−0.05	−0.01	66	2000	1.20	0.40	−1.07	−0.16
19	2011	1.15	1.03	0.28	0.03	67	1999	5.08	2.70	−4.53	−0.17
20	1999	3.32	3.02	−0.57	−0.01	68	2010	0.61	0.49	0.10	0.02
21	2011	2.10	1.77	0.50	0.02	69	2001	1.89	1.56	−0.59	−0.03
22	2011	0.54	0.31	0.25	0.06	70	2010	1.01	0.83	0.08	0.02
23	2006	1.69	1.39	0.03	0.01	71	2009	2.59	1.75	0.07	0.02
24	2001	0.31	0.27	−0.06	−0.01	72	2007	0.71	0.42	−0.13	0.01
25	2001	2.55	2.02	−0.88	−0.03	73	2009	1.30	0.83	0.11	0.03
26	2007	0.13	0.06	−0.02	0.11	74	2007	0.82	0.57	0.10	0.03
27	2008	0.40	0.35	0.10	0.03	75	2007	0.07	0.03	0.03	0.49
28	2011	0.41	0.27	0.18	0.05	76	2009	0.71	0.58	0.15	0.03
29	2011	0.99	0.59	0.62	0.10	78	2011	0.37	0.14	0.27	0.20
30	1999	0.08	0.05	−0.03	−0.04	79	1999	0.68	0.50	−0.17	0.03
31	2005	0.23	0.16	0.01	0.05	80	2001	6.10	4.79	1.45	0.06
32	2011	0.40	0.32	0.13	0.03	81	2000	0.77	0.37	0.01	0.22
33	2010	1.18	0.87	0.58	0.06	82	2011	0.48	0.32	0.23	0.07
34	2008	1.71	0.73	0.49	0.13	83	2008	0.87	0.68	0.45	0.07
35	2011	1.98	1.71	0.35	0.02	84	2006	1.31	1.20	−0.01	0.00
36	2004	0.54	0.35	−0.26	−0.05	85	2002	1.66	1.41	−0.29	−0.02
37	2011	0.28	0.12	0.25	0.21	86	1999	0.08	0.03	−0.03	0.18
38	2010	0.36	0.25	0.09	0.04	87	2010	1.18	0.73	0.65	0.10
39	2005	1.63	1.40	0.49	0.03	88	2007	0.73	0.42	0.53	1.87
40	2011	7.17	5.54	3.73	0.07	89	2011	0.62	0.20	0.46	1.51
41	2008	1.35	1.18	0.10	0.01	90	2002	0.55	0.51	0.02	0.00
42	1999	3.66	1.42	−3.19	−0.15	91	2002	2.30	1.66	−0.43	−0.02
43	2005	0.08	0.04	−0.01	0.00	92	1999	0.80	0.33	−0.57	−0.09
44	2011	1.25	0.92	0.53	0.05	93	2004	0.48	0.14	0.04	1.12
45	2011	0.01	0.00	0.00	0.35	94	2002	1.15	0.89	−0.58	−0.06
46	2004	0.72	0.55	−0.10	−0.01	95	2001	1.56	1.14	−0.73	−0.05
47	2000	0.66	0.38	−0.41	−0.07	96	2000	1.28	1.01	−0.50	−0.04
48	2011	1.08	0.60	0.56	0.09	97	2008	0.10	0.03	0.07	1.28

Shaded cells are the 5 maximum values in each column (Max, Mean, Change, and Growth). Year is the year of the maximum RCA of the product in the period. Mean is the average of RCA in the period. Change is the change of RCA from 1999 to 2011. Growth is the average annual growth of RCA during the period

TABLE 11.

Vietnamese RCA of 96 products at 2-digit HS 1996 during 2000-2010

HSCode	Year	Max	Mean	Change	Growth	HSCode	Year	Max	Mean	Change	Growth
1	2001	0.22	0.11	−0.11	−0.11	49	2002	0.19	0.07	0.02	1.06
2	2001	0.41	0.19	−0.16	−0.03	50	2001	7.89	4.44	−3.51	−0.06
3	2002	18.08	14.86	−6.26	−0.04	51	2007	0.20	0.08	0.09	5.30
4	2001	2.53	0.81	−1.06	−0.02	52	2010	2.60	0.91	2.06	0.23
5	2001	2.81	0.87	−1.26	−0.08	53	2009	2.55	1.62	1.15	0.12
6	2010	0.28	0.16	0.20	0.45	54	2010	2.56	1.35	1.85	0.15
7	2009	1.77	1.37	−0.08	0.04	55	2010	3.12	1.87	2.12	0.16
8	2001	5.71	4.18	−2.03	−0.03	56	2003	1.25	1.07	0.59	0.11
9	2007	25.23	19.63	−8.55	−0.03	57	2000	0.70	0.35	−0.39	−0.02
10	2005	10.11	7.63	−1.03	0.00	58	2006	0.82	0.51	0.40	0.17
11	2010	5.25	3.27	3.92	0.22	59	2010	2.58	0.79	2.39	0.38
12	2000	2.17	0.82	−1.90	−0.10	60	2010	1.30	0.59	1.29	1.51
13	2005	1.20	0.64	−0.66	−0.11	61	2010	6.37	4.64	4.83	0.20
14	2001	15.13	5.19	1.81	2.84	62	2000	7.21	6.73	−0.35	0.00
15	2000	1.43	0.45	−1.17	−0.04	63	2010	3.51	2.85	1.03	0.05
16	2010	5.09	3.24	4.38	0.27	64	2003	16.74	14.74	−3.80	−0.03
17	2001	1.04	0.53	−0.43	0.01	65	2004	8.51	6.17	1.52	0.05
18	2010	0.04	0.02	0.03	0.31	66	2006	0.68	0.35	−0.01	0.21
19	2001	2.06	1.35	−0.34	−0.01	67	2000	4.11	1.96	−3.32	−0.08
20	2002	1.45	0.90	0.27	0.17	68	2009	0.80	0.52	0.53	0.15
21	2001	0.98	0.49	−0.47	−0.01	69	2005	2.35	2.06	−0.64	−0.03
22	2010	0.24	0.14	0.16	0.14	70	2010	1.16	0.53	0.88	0.25
23	2010	0.48	0.22	0.45	0.51	71	2009	1.95	0.54	1.18	0.33
24	2003	2.12	1.17	0.96	0.29	72	2008	0.84	0.26	0.49	0.39
25	2010	1.15	0.57	0.89	0.19	73	2010	0.65	0.49	0.36	0.10
26	2004	0.94	0.53	−0.44	−0.08	74	2010	0.42	0.11	0.38	0.48
27	2000	2.92	1.97	−2.11	−0.12	75	2002	0.00	0.00	0.00	4.49
28	2010	0.21	0.09	0.16	0.20	76	2003	0.20	0.16	0.11	0.12
29	2010	0.11	0.08	0.02	0.04	78	2010	0.52	0.17	0.31	0.30
30	2001	0.03	0.02	0.00	0.02	79	2002	0.87	0.26	0.32	5.65
31	2008	0.89	0.46	0.54	0.52	80	2000	4.18	2.13	−3.21	−0.04
32	2010	0.10	0.07	0.07	0.27	81	2001	0.36	0.14	0.28	0.78
33	2003	0.28	0.20	−0.03	−0.01	82	2007	0.71	0.50	0.46	0.20
34	2008	1.19	0.96	0.39	0.06	83	2010	0.43	0.24	0.36	0.23
35	2010	0.54	0.34	0.54	0.14	84	2010	0.33	0.26	0.07	0.04
36	2001	0.29	0.15	−0.03	0.25	85	2010	0.80	0.44	0.54	0.12
37	2002	0.37	0.12	−0.09	0.24	86	2010	0.16	0.03	0.16	1.74
38	2010	0.29	0.14	0.22	0.18	87	2004	0.14	0.11	0.07	0.12
39	2008	0.59	0.41	0.34	0.10	88	2000	0.08	0.02	−0.04	0.11
40	2006	3.58	2.62	1.99	0.10	89	2008	0.66	0.21	0.55	1.00

TABLE 11—*Continued*

HSCode	Year	Max	Mean	Change	Growth	HSCode	Year	Max	Mean	Change	Growth
41	2008	2.13	0.88	1.44	0.29	90	2009	0.38	0.16	0.2670.20	
42	2003	4.00	3.55	−0.52	−0.01	91	2000	0.24	0.17	−0.13	−0.03
43	2001	0.90	0.16	0.02	3.07	92	2009	0.64	0.42	0.52	0.23
44	2010	1.62	0.99	0.73	0.07	93	2002	0.03	0.01	0.00	−0.55
45	2007	0.02	0.0170.01	1.96	94	2007	3.92	2.88	2.28	0.12	
46	2001	31.76	24.54	−15.97	−0.07	95	2010	0.91	0.66	0.28	0.05
47	2010	0.04	0.01	0.04	8.29	96	2006	1.42	1.16	0.56	0.07
48	2010	0.42	0.30	0.18	0.06	97	2000	0.44	0.05	−0.43	

Shaded cells are the 5 maximum values in each column (Max, Mean, Change, and Growth). Year is the year of the maximum RCA of the product in the period. Mean is the average of RCA in the period. Change is the change of RCA from 2000 to 2010. Growth is the average annual growth of RCA during the period.

APPENDIX C

LFI Indices

TABLE 12.

Indonesian LFI of 96 products at 2-digit HS 1996 during 1996-2011

HSCode	Year	Max	Mean	Change	Growth	HSCode	Year	Max	Mean	Change	Growth
1	1998	−0.05	−0.11	0.14	0.04	49	2006	0.00	−0.02	0.04	−1.72
2	1998	−0.01	−0.07	−0.05	0.32	50	2004	0.00	0.00	0.00	1.24
3	1998	1.71	1.00	−1.03	−0.07	51	2005	0.00	−0.02	0.01	0.16
4	1997	−0.16	−0.28	−0.06	0.05	52	2005	−0.17	−0.61	−0.05	0.07
5	2005	0.00	−0.01	0.00	0.12	53	2005	−0.01	−0.01	0.00	0.05
6	2003	0.01	0.00	0.00	−1.77	54	1997	0.52	0.36	−0.50	−0.14
7	1996	−0.06	−0.10	−0.09	0.12	55	1996	0.59	0.37	−0.30	−0.02
8	1998	0.05	−0.10	−0.11	−0.22	56	2005	0.00	−0.05	0.09	2.34
9	1998	1.11	0.52	−0.61	−0.05	57	1999	0.03	0.01	−0.01	0.14
10	2005	−0.73	−1.41	0.92	0.06	58	2007	0.00	−0.03	−0.03	−1.51
11	1996	−0.01	−0.13	−0.14	0.46	59	2005	−0.03	−0.11	0.04	0.03
12	1998	−0.19	−0.38	0.05	0.10	60	2004	−0.01	−0.15	−0.15	1.61
13	2007	0.00	0.00	−0.01	−0.86	61	2001	1.25	1.00	−0.31	−0.01
14	2004	0.03	0.02	0.01	0.07	62	1996	2.29	1.75	−1.33	−0.05
15	2008	5.64	2.93	3.89	0.14	63	2001	0.18	0.10	−0.09	−0.04
16	2009	0.22	0.13	0.08	0.08	64	1996	2.05	0.98	−1.33	−0.06
17	2008	−0.12	−0.46	0.04	0.17	65	2001	0.02	0.01	−0.01	0.18
18	1998	0.56	0.37	−0.08	0.03	66	1999	0.02	0.01	−0.01	0.33
19	2011	0.08	0.04	0.05	0.28	67	2010	0.06	0.04	0.04	0.10

TABLE 12—*Continued*

HSCode	Year	Max	Mean	Change	Growth	HSCode	Year	Max	Mean	Change	Growth
20	1996	0.15	0.06	−0.11	0.12	68	2001	0.03	−0.01	0.02	−40.95
21	1998	−0.02	−0.07	0.00	0.05	69	1999	0.07	0.02	0.08	−0.25
22	2011	0.02	−0.01	0.05	−1.48	70	2004	0.17	0.10	−0.09	0.72
23	1998	−0.37	−0.61	−0.01	0.03	71	1998	2.53	0.56	−0.02	0.14
24	1998	0.15	0.00	0.00	0.22	72	1999	−0.84	−1.80	−0.20	0.05
25	2001	−0.14	−0.21	0.15	−0.02	73	2007	−0.40	−0.79	0.48	0.02
26	2010	2.41	1.59	0.03	0.04	74	2007	0.96	0.32	0.89	0.08
27	1997	9.12	3.01	−3.32	−0.71	75	2007	0.97	0.31	0.10	−0.49
28	2008	−0.29	−0.49	0.24	−0.02	76	1996	0.01	−0.15	−0.33	−0.32
29	2011	−0.95	−1.93	1.35	−0.05	78	1999	−0.03	−0.06	0.00	0.05
30	2011	−0.05	−0.09	0.05	0.01	79	2011	−0.09	−0.13	0.05	0.00
31	1997	0.06	−0.29	−0.64	−0.85	80	2008	0.71	0.37	0.31	0.15
32	2008	−0.21	−0.40	0.25	−0.04	81	2002	−0.01	−0.02	0.03	−0.01
33	2011	−0.07	−0.13	0.05	−0.01	82	2000	−0.06	−0.11	−0.01	0.03
34	2009	0.07	−0.07	0.17	−0.41	83	2005	−0.06	−0.08	−0.03	0.04
35	2006	−0.09	−0.13	0.03	−0.01	84	2006	−3.66	−5.69	4.82	−0.02
36	1996	−0.01	−0.03	−0.02	0.13	85	2000	2.99	0.15	−0.79	−1.15
37	2011	−0.03	−0.08	0.12	−0.08	86	2005	0.02	−0.02	−0.03	10.26
38	2011	0.41	−0.22	0.79	0.23	87	2007	−0.90	−1.75	1.52	0.02
39	2005	−0.58	−0.80	−0.39	0.03	88	2001	−0.10	−0.52	−0.66	0.19
40	2011	2.84	1.51	1.03	0.08	89	1998	0.12	−0.48	−0.16	0.42
41	2007	0.02	−0.13	0.22	−0.02	90	2002	−0.16	−0.33	0.14	0.05
42	2001	0.25	0.11	−0.18	−0.12	91	1996	0.06	0.00	−0.07	0.04
43	2005	0.00	0.00	0.00	−0.17	92	2004	0.18	0.11	0.00	0.10
44	1996	5.04	2.22	−4.34	−0.12	93	2006	−0.01	−0.03	0.03	0.55
45	2001	0.00	0.00	0.00	0.07	94	2002	1.19	0.83	−0.57	0.02
46	1996	0.06	0.04	−0.05	0.02	95	1996	0.35	0.09	−0.32	−0.01
47	2008	−0.05	−0.32	0.26	0.13	96	2005	0.01	−0.01	−0.04	−5.86
48	1999	1.39	0.98	0.04	0.04	97	1998	0.00	0.00	0.02	2.79

Shaded cells are the 5 maximum values in each column (Max, Mean, Change, and Growth). Year is the year of the maximum LFI of the product in the period. Mean is the average of LFI in the period. Change is the change of LFI from 1996 to 2011. Growth is the average annual growth of LFI during the period.

TABLE 13.

Malaysian LFI of 96 products at 2-digit HS 1996 during 1997-2011

HSCode	Year	Max	Mean	Change	Growth	HSCode	Year	Max	Mean	Change	Growth
1	1997	0.10	0.03	−0.07	0.00	49	2007	−0.01	−0.03	0.02	0.13
2	2006	−0.10	−0.13	−0.06	0.04	50	2003	0.00	−0.01	0.01	−0.04
3	2008	0.01	−0.04	−0.01	−0.55	51	1997	0.07	0.01	−0.07	−1.05
4	2009	−0.09	−0.14	0.02	0.02	52	2008	−0.05	−0.11	0.07	−0.01
5	2006	0.00	0.00	0.00	0.04	53	2009	0.00	0.00	0.00	0.08
6	2011	0.03	0.02	0.02	0.15	54	1997	0.21	0.14	−0.10	−0.03
7	2008	−0.11	−0.15	0.00	0.02	55	1998	0.04	0.00	−0.01	0.11
8	2000	−0.02	−0.04	−0.03	0.07	56	2006	0.02	0.00	0.03	0.15
9	1997	0.01	−0.04	−0.10	0.28	57	2007	0.00	−0.01	0.00	0.21
10	2003	−0.34	−0.46	0.01	0.01	58	2008	0.00	−0.01	0.02	−0.07
11	2002	−0.03	−0.05	−0.06	0.08	59	2008	−0.02	−0.03	0.02	−0.04
12	2006	−0.10	−0.14	0.02	0.00	60	2010	−0.01	−0.05	0.05	−0.06
13	2005	−0.01	−0.01	0.00	0.03	61	1997	0.43	0.27	−0.32	−0.09
14	2010	0.01	0.00	0.00	0.53	62	1998	0.31	0.15	−0.29	−0.18
15	2008	4.09	2.67	1.24	0.06	63	2007	−0.02	−0.03	0.00	0.05
16	1997	0.04	0.02	−0.03	−0.07	64	1998	0.02	0.00	−0.05	−0.80
17	2004	−0.10	−0.16	−0.05	0.04	65	1997	0.01	0.00	−0.01	−0.07
18	1997	0.11	−0.02	−0.15	0.44	66	2000	0.00	0.00	0.00	0.48
19	2011	0.06	0.01	0.06	−1.38	67	2004	0.00	0.00	0.00	−0.16
20	1998	0.00	−0.02	−0.03	0.34	68	2011	0.03	0.00	0.04	−1.27
21	2011	0.01	−0.02	0.08	−1.38	69	1997	0.04	0.02	−0.05	−0.95
22	2001	0.03	0.01	−0.01	0.39	70	2008	0.08	−0.02	−0.05	−0.16
23	2003	−0.09	−0.13	0.02	0.02	71	2005	−0.20	−0.39	0.08	0.09
24	1998	0.02	−0.01	−0.06	0.37	72	2003	−0.93	−1.19	0.69	0.00
25	2009	0.01	−0.07	0.30	−0.42	73	2010	−0.17	−0.33	0.00	0.09
26	2002	−0.08	−0.14	−0.08	0.05	74	2003	−0.26	−0.42	−0.24	0.06
27	2008	4.35	2.56	0.36	0.04	75	2001	−0.01	−0.02	0.00	0.17
28	2005	−0.22	−0.26	0.04	0.00	76	2003	−0.24	−0.29	0.06	0.00
29	2003	−0.05	−0.22	0.40	0.07	78	2005	−0.01	−0.03	0.02	0.11
30	2000	−0.15	−0.22	−0.10	0.05	79	2008	−0.02	−0.06	0.00	0.12
31	2001	−0.11	−0.23	−0.15	0.12	80	1997	0.10	0.04	−0.04	−2.36
32	2011	−0.05	−0.10	0.09	−0.04	81	2010	−0.01	−0.03	−0.01	0.31
33	2007	−0.12	−0.14	−0.01	0.01	82	2011	−0.07	−0.11	0.07	−0.03
34	2008	0.06	0.03	0.03	0.19	83	2003	0.00	−0.03	0.01	0.26
35	2002	−0.02	−0.03	−0.01	0.04	84	2000	4.42	1.90	0.42	−0.25
36	2008	0.00	0.00	0.00	0.66	85	1997	1.68	−1.92	−1.69	−0.11

TABLE 13—*Continued*

HSCode	Year	Max	Mean	Change	Growth	HSCode	Year	Max	Mean	Change	Growth
37	2008	−0.01	−0.02	0.04	−0.02	86	2008	0.04	−0.04	0.14	0.38
38	2008	0.45	0.31	0.00	0.04	87	1998	−0.32	−1.00	0.45	0.08
39	2008	−0.01	−0.30	0.45	0.20	88	2003	−0.04	−0.40	−0.14	0.75
40	1997	1.17	0.84	−0.03	0.03	89	2006	−0.02	−0.26	0.49	1.32
41	1998	0.01	−0.04	−0.02	−0.32	90	2010	−0.06	−0.35	0.44	0.02
42	1998	0.01	−0.02	−0.07	0.27	91	1997	−0.01	−0.08	−0.11	0.30
43	2008	0.00	0.00	0.00	36.94	92	2001	0.05	0.01	−0.02	−0.73
44	1997	2.74	1.41	−1.91	−0.08	93	2001	0.00	−0.01	0.00	−1.38
45	2011	0.00	0.00	0.00	0.18	94	1999	0.76	0.63	−0.22	−0.03
46	1997	0.00	0.00	0.00	−0.37	95	1998	0.11	0.03	−0.09	0.71
47	1997	−0.03	−0.05	−0.03	0.07	96	2005	0.01	−0.01	0.02	−0.66
48	2011	−0.29	−0.42	0.25	−0.04	97	2000	0.00	0.00	0.00	1.15

Shaded cells are the 5 maximum values in each column (Max, Mean, Change, and Growth). Year is the year of the maximum LFI of the product in the period. Mean is the average of LFI in the period. Change is the change of LFI from 1997 to 2011. Growth is the average annual growth of LFI during the period

TABLE 14.

Philippines LFI of 96 products at 2-digit HS 1996 during 2000-2011

HSCode	Year	Max	Mean	Change	Growth	HSCode	Year	Max	Mean	Change	Growth
1	2008	−0.01	−0.03	0.08	−0.12	49	2007	−0.03	−0.08	−0.02	0.12
2	2003	−0.15	−0.21	−0.14	0.06	50	2008	0.00	0.00	0.00	0.44
3	2001	0.38	0.27	−0.02	0.02	51	2011	−0.01	−0.03	0.03	−0.11
4	2006	−0.33	−0.44	−0.03	0.03	52	2010	−0.11	−0.25	0.30	−0.09
5	2004	0.00	0.00	−0.01	−0.12	53	2011	0.02	0.01	0.02	0.28
6	2011	0.00	0.00	0.00	0.33	54	2009	−0.05	−0.14	0.14	−0.03
7	2005	0.00	−0.02	−0.02	3.40	55	2008	−0.13	−0.19	0.18	−0.06
8	2011	1.06	0.65	0.55	0.12	56	2002	0.04	0.02	0.01	0.93
9	2004	−0.01	−0.03	−0.04	0.36	57	2004	0.00	0.00	0.00	1.49
10	2004	−0.71	−1.21	−0.45	0.10	58	2005	−0.01	−0.03	0.05	0.23
11	2002	−0.07	−0.11	−0.07	0.07	59	2010	−0.02	−0.06	0.08	−0.03
12	2006	−0.04	−0.08	0.02	0.05	60	2010	−0.18	−0.28	0.13	−0.02
13	2011	0.18	0.06	0.15	0.22	61	2006	1.27	1.00	−0.10	0.01
14	2011	0.00	0.00	0.00	0.54	62	2001	2.34	1.49	−1.44	−0.10
15	2011	1.36	0.70	0.87	0.14	63	2000	0.08	0.05	−0.06	−0.10
16	2009	0.39	0.21	0.29	0.19	64	2001	0.03	−0.02	−0.13	0.51
17	2011	0.36	0.04	0.39	−0.82	65	2000	0.04	0.01	−0.04	−0.10

TABLE 14—*Continued*

HSCode	Year	Max	Mean	Change	Growth	HSCode	Year	Max	Mean	Change	Growth
18	2007	−0.03	−0.05	−0.03	0.07	66	2011	0.01	0.00	0.01	−0.67
19	2003	−0.04	−0.07	0.00	0.06	67	2011	0.05	0.02	0.03	0.13
20	2011	0.44	0.27	0.28	0.13	68	2007	0.01	−0.01	0.03	−0.12
21	2000	−0.15	−0.24	−0.29	0.11	69	2006	0.13	−0.01	−0.15	3.68
22	2007	−0.01	−0.06	−0.07	0.60	70	2006	0.37	0.03	−0.04	2.32
23	2003	−0.36	−0.48	−0.36	0.08	71	2011	0.55	0.18	0.36	581.22
24	2011	0.27	−0.03	0.43	0.32	72	2007	−0.62	−0.98	0.25	0.00
25	2005	0.00	−0.09	0.01	1.90	73	2007	−0.15	−0.22	0.15	−0.03
26	2011	0.66	−0.09	0.94	0.53	74	2008	1.30	0.60	0.98	0.49
27	2002	−3.55	−6.21	−4.89	0.08	75	2005	0.00	−0.01	0.00	0.10
28	2011	0.05	−0.16	0.29	0.10	76	2008	−0.14	−0.18	−0.06	0.04
29	2011	−0.37	−0.57	0.38	−0.05	78	2008	0.00	−0.01	0.01	0.33
30	2002	−0.36	−0.47	−0.35	0.07	79	2009	−0.02	−0.04	0.03	0.00
31	2005	−0.12	−0.22	−0.06	0.11	80	2011	0.03	0.01	0.03	0.01
32	2007	−0.15	−0.20	0.00	0.01	81	2004	0.13	0.05	−0.03	0.15
33	2007	−0.14	−0.19	0.03	0.01	82	2003	−0.01	−0.02	0.00	0.05
34	2011	0.05	−0.06	0.15	−0.50	83	2011	0.02	−0.01	0.04	−4.04
35	2007	−0.06	−0.09	−0.01	0.03	84	2009	4.50	3.56	−1.83	−0.02
36	2000	0.00	0.00	−0.01	−2.48	85	2010	7.98	5.06	0.06	0.05
37	2010	−0.03	−0.06	0.07	−0.08	86	2004	0.01	−0.03	0.03	0.89
38	2007	−0.22	−0.33	−0.13	0.05	87	2005	0.63	0.04	0.90	0.08
39	2009	−0.70	−0.92	−0.17	0.03	88	2004	0.10	−0.13	−0.34	−1.63
40	2011	0.24	0.03	0.37	−1.18	89	2011	0.71	0.15	0.63	−0.85
41	2008	−0.03	−0.05	0.05	−0.07	90	2009	0.88	0.30	0.46	30.20
42	2001	0.51	0.20	−0.42	−0.18	91	2002	0.15	0.02	−0.16	−0.34
43	2011	0.01	0.00	0.01	0.79	92	2002	0.00	−0.01	0.00	0.09
44	2011	1.99	0.47	1.94	−2.23	93	2010	0.01	0.00	−0.01	−2.59
45	2008	0.00	0.00	0.00	2.50	94	2001	0.42	0.26	−0.35	−0.12
46	2001	0.14	0.09	−0.07	−0.04	95	2001	0.12	0.06	−0.04	−0.60
47	2011	0.07	−0.02	0.20	0.02	96	2007	−0.01	−0.03	0.05	0.11
48	2007	−0.32	−0.39	−0.08	0.02	97	2006	0.01	0.00	0.00	0.14

Shaded cells are the 5 maximum values in each column (Max, Mean, Change, and Growth). Year is the year of the maximum LFI of the product in the period. Mean is the average of LFI in the period. Change is the change of LFI from 2000 to 2011. Growth is the average annual growth of LFI during the period.

TABLE 15.

Singaporean LFI of 96 products at 2-digit HS 1996 during 1997-2011

HSCode	Year	Max	Mean	Change	Growth	HSCode	Year	Max	Mean	Change	Growth
1	2011	−0.03	−0.05	0.06	−0.05	49	2001	0.15	0.08	−0.03	0.06
2	1997	−0.08	−0.10	−0.02	0.03	50	2009	0.00	0.00	0.01	−0.02
3	1998	0.00	−0.05	−0.06	−0.80	51	2009	0.00	0.00	0.01	−0.96
4	2002	−0.06	−0.09	−0.05	0.06	52	2008	0.00	−0.01	0.02	0.08
5	1998	0.00	0.00	0.00	−2.34	53	2010	0.00	0.00	0.00	−0.01
6	2004	0.00	−0.01	0.00	0.06	54	2002	0.06	0.03	−0.02	−0.03
7	2006	−0.05	−0.06	0.00	0.02	55	1998	0.00	−0.01	0.00	−0.54
8	2008	−0.05	−0.07	0.02	−0.01	56	2010	−0.01	−0.01	0.00	−0.01
9	1998	0.08	0.01	−0.05	−0.64	57	2011	−0.01	−0.01	0.02	−0.06
10	2006	−0.03	−0.05	0.03	−0.02	58	2005	0.00	−0.01	0.02	−0.04
11	2006	−0.01	−0.02	0.01	−0.01	59	2008	0.00	−0.01	0.01	0.09
12	1998	0.00	−0.01	−0.01	0.20	60	2011	0.00	−0.02	0.02	−0.06
13	2007	0.00	0.00	0.00	−0.81	61	2000	0.06	−0.01	−0.12	−0.28
14	1997	0.01	0.00	−0.01	1.35	62	2000	−0.07	−0.09	0.04	−0.01
15	1997	0.01	−0.01	−0.11	−1.02	63	2010	−0.02	−0.02	0.01	−0.02
16	2006	−0.04	−0.05	0.00	0.02	64	2008	−0.03	−0.04	0.01	0.00
17	2008	−0.01	−0.03	0.01	0.02	65	1999	0.00	0.00	0.00	−0.01
18	1998	0.05	0.02	−0.02	−0.09	66	2005	0.00	0.00	0.00	0.00
19	2009	0.11	0.03	0.09	−0.24	67	2006	0.00	0.00	0.00	0.01
20	2006	−0.02	−0.03	0.01	−0.01	68	2004	−0.04	−0.06	0.03	−0.02
21	2011	0.03	0.00	0.03	−0.17	69	2006	−0.03	−0.05	0.07	−0.06
22	2009	−0.01	−0.04	0.00	0.04	70	2011	−0.04	−0.06	0.03	0.00
23	2011	0.02	0.01	0.01	0.17	71	1998	0.54	−0.19	0.07	−0.26
24	1997	0.10	0.02	−0.09	−0.62	72	2009	−0.21	−0.32	0.23	−0.01
25	2006	−0.06	−0.12	0.06	0.04	73	2010	−0.17	−0.29	0.17	−0.01
26	2001	0.01	−0.01	0.01	−0.17	74	2002	−0.05	−0.08	0.05	0.05
27	1998	−0.28	−2.68	−5.39	0.34	75	2003	0.02	−0.01	0.00	−0.52
28	2009	−0.10	−0.11	−0.03	0.03	76	2007	−0.08	−0.18	0.03	0.10
29	2003	2.37	1.39	1.50	0.19	78	2003	0.01	−0.01	0.00	−0.31
30	2007	0.70	0.22	0.50	14.52	79	2004	0.04	−0.02	0.07	−1.49
31	2009	0.00	0.00	0.00	−0.22	80	1997	0.10	0.02	−0.11	−1.59
32	2003	0.16	0.07	0.03	−2.15	81	2004	0.00	−0.01	−0.01	4.28
33	2011	0.25	0.04	0.26	2.08	82	2009	0.02	−0.03	0.02	0.07
34	2011	0.02	0.00	0.03	−0.13	83	2008	0.04	0.00	0.02	−2.04
35	2008	0.00	−0.01	0.00	0.53	84	1997	5.58	2.45	−4.87	−0.11
36	2008	0.00	0.00	0.00	0.27	85	2008	4.13	2.21	3.31	−1.04

TABLE 15—*Continued*

HSCode	Year	Max	Mean	Change	Growth	HSCode	Year	Max	Mean	Change	Growth
37	2004	0.10	0.00	0.00	−1.00	86	1997	0.00	−0.02	−0.03	2.73
38	2008	0.14	−0.05	0.17	−0.29	87	2010	−0.10	−0.37	0.28	−0.05
39	2011	0.74	0.47	0.74	0.56	88	2011	−0.15	−0.74	0.81	0.28
40	2008	−0.01	−0.04	−0.01	0.06	89	2011	0.50	−0.06	1.09	7.38
41	2001	0.01	0.00	0.01	−0.53	90	2011	0.30	−0.15	0.81	4.47
42	2008	−0.04	−0.06	0.01	0.00	91	1997	−0.01	−0.07	−0.09	0.43
43	1997	0.00	0.00	0.00	−0.87	92	1998	0.00	−0.01	0.00	0.06
44	2002	−0.01	−0.04	−0.01	0.20	93	2008	0.00	0.00	0.00	−0.25
45	1998	0.00	0.00	0.00	−0.42	94	2005	−0.09	−0.14	0.05	−0.01
46	2008	0.00	0.00	0.00	−0.03	95	2011	0.00	−0.05	0.06	−0.04
47	1998	0.07	0.02	0.01	0.53	96	2006	0.00	−0.01	0.04	0.06
48	2009	−0.03	−0.11	0.12	−0.05	97	2006	0.01	−0.01	0.00	−0.77

Shaded cells are the 5 maximum values in each column (Max, Mean, Change, and Growth). Year is the year of the maximum LFI of the product in the period. Mean is the average of LFI in the period. Change is the change of LFI from 1997 to 2011. Growth is the average annual growth of LFI during the period.

TABLE 16.

Thai LFI of 96 products at 2-digit HS 1996 during 1999-2011

HSCode	Year	Max	Mean	Change	Growth	HSCode	Year	Max	Mean	Change	Growth
1	2009	0.03	0.00	0.02	−0.87	49	2011	0.83	0.16	0.86	0.70
2	2001	0.47	0.16	−0.36	−0.04	50	2000	0.01	0.00	−0.01	−0.01
3	2000	1.12	0.42	−0.95	−0.12	51	2011	−0.01	−0.03	0.04	−0.10
4	2009	−0.07	−0.12	0.11	−0.01	52	2009	−0.10	−0.21	0.14	−0.03
5	2004	0.00	−0.01	0.00	0.13	53	2010	0.00	−0.01	0.02	−0.31
6	2002	0.05	0.03	−0.01	−0.02	54	2005	0.08	0.02	0.05	0.15
7	1999	0.37	0.23	−0.16	−0.02	55	1999	0.34	0.28	−0.08	−0.01
8	2000	0.14	0.09	0.00	0.07	56	2005	0.06	0.04	0.01	0.10
9	1999	0.04	0.01	−0.06	−0.29	57	2007	0.05	0.04	0.00	0.01
10	2008	1.69	1.26	−0.24	0.01	58	2003	0.02	0.01	0.02	17.75
11	2011	0.17	0.10	0.10	0.10	59	2003	−0.03	−0.04	0.01	0.02
12	2006	−0.14	−0.24	−0.06	0.05	60	2011	−0.03	−0.09	0.12	−0.12
13	2006	−0.01	−0.01	0.00	0.07	61	1999	1.42	0.86	−1.02	−0.10
14	2004	0.00	0.00	−0.01	0.28	62	1999	1.22	0.68	−1.02	−0.14
15	2008	0.12	0.04	0.06	0.46	63	2001	0.13	0.09	−0.10	−0.10
16	1999	2.00	1.66	−0.45	−0.02	64	1999	0.71	0.38	−0.57	−0.12

TABLE 16—*Continued*

HSCode	Year	Max	Mean	Change	Growth	HSCode	Year	Max	Mean	Change	Growth
17	2011	0.82	0.53	0.30	0.06	65	2000	0.03	0.02	−0.02	−0.08
18	2005	−0.01	−0.02	−0.01	0.13	66	2000	0.01	0.00	−0.01	−1.65
19	2011	0.09	0.07	0.04	0.06	67	1999	0.06	0.03	−0.05	−0.16
20	1999	0.65	0.47	−0.24	−0.03	68	2011	0.02	0.00	0.03	−0.06
21	2009	0.24	0.19	0.05	0.03	69	2000	0.28	0.16	−0.23	−0.39
22	2011	0.12	0.03	0.10	0.54	70	2002	0.07	0.01	0.03	0.71
23	2005	−0.08	−0.17	0.08	0.04	71	2009	1.09	−0.04	−2.09	−1.78
24	2007	0.00	−0.02	0.05	0.01	72	2000	−1.67	−2.43	−0.32	0.03
25	1999	0.26	0.18	−0.14	−0.04	73	2009	−0.15	−0.53	1.01	0.10
26	2011	−0.05	−0.10	0.07	−0.03	74	2000	−0.36	−0.53	−0.25	0.07
27	1999	−3.92	−5.87	−2.88	0.05	75	1999	−0.01	−0.02	−0.01	0.10
28	2011	−0.23	−0.30	0.04	0.01	76	2009	−0.34	−0.45	0.11	−0.01
29	2011	0.05	−0.63	1.09	−0.16	78	1999	−0.03	−0.04	−0.03	0.09
30	2000	−0.21	−0.27	−0.04	0.03	79	1999	0.01	−0.01	−0.01	0.18
31	2006	−0.35	−0.44	−0.14	0.04	80	2001	0.07	0.03	−0.08	−3.96
32	2011	−0.21	−0.34	0.22	−0.05	81	2002	0.01	−0.01	0.00	−0.36
33	2011	0.19	0.09	0.19	1.02	82	2008	−0.12	−0.21	0.08	−0.02
34	2008	0.13	−0.06	0.13	−0.62	83	2008	0.05	0.01	0.08	−0.34
35	2011	0.10	0.09	0.01	0.02	84	2007	2.75	1.56	−1.38	0.68
36	2000	0.00	0.00	−0.01	−0.87	85	2004	0.39	−0.91	0.73	−0.79
37	2011	−0.03	−0.08	0.10	−0.10	86	2011	0.00	−0.02	0.13	2.05
38	2010	−0.46	−0.53	0.10	−0.01	87	2008	3.07	1.55	1.68	0.30
39	2011	0.99	0.37	1.40	−0.49	88	2004	0.20	−0.24	1.74	0.46
40	2011	4.30	2.49	2.89	0.11	89	2006	−0.02	−0.11	−0.18	0.73
41	2011	−0.03	−0.09	0.19	−0.13	90	2002	0.02	−0.15	−0.02	−1.37
42	1999	0.54	0.19	−0.51	−0.23	91	2002	0.09	0.02	−0.06	2.07
43	2009	0.00	0.00	0.01	1.11	92	1999	0.01	0.00	−0.02	0.22
44	2011	0.30	0.17	0.18	0.10	93	2004	0.01	−0.02	−0.05	−0.42
45	2011	0.00	0.00	0.00	−0.10	94	2002	0.70	0.48	−0.54	−0.12
46	2002	0.01	0.00	0.00	−0.05	95	1999	0.35	0.23	−0.24	−0.09
47	2005	−0.12	−0.16	0.06	−0.01	96	1999	0.03	0.01	−0.03	−0.21
48	2011	0.27	0.03	0.21	8.24	97	2011	0.00	0.00	0.00	4.26

Shaded cells are the 5 maximum values in each column (Max, Mean, Change, and Growth). Year is the year of the maximum LFI of the product in the period. Mean is the average of LFI in the period. Change is the change of LFI from 1999 to 2011. Growth is the average annual growth of LFI during the period.

TABLE 17.

Vietnamese LFI of 96 products at 2-digit HS 1996 during 2000-2010

HSCode	Year	Max	Mean	Change	Growth	HSCode	Year	Max	Mean	Change	Growth
1	2001	0.01	−0.01	−0.02	0.34	49	2002	0.01	−0.03	−0.03	−0.45
2	2001	0.13	0.03	−0.11	0.91	50	2001	0.08	0.01	−0.07	−1.16
3	2001	5.68	3.98	−2.44	−0.06	51	2000	−0.01	−0.02	−0.03	0.24
4	2002	0.00	−0.16	−0.08	18.14	52	2001	−0.59	−0.72	−0.11	0.02
5	2001	0.04	−0.02	−0.03	−0.43	53	2002	0.03	0.02	−0.01	0.10
6	2001	0.01	0.00	0.00	0.16	54	2009	−0.27	−0.45	0.23	−0.04
7	2009	0.27	0.18	−0.02	0.11	55	2010	−0.74	−1.42	1.25	−0.09
8	2001	1.15	0.76	−0.40	−0.04	56	2010	−0.11	−0.16	0.02	0.00
9	2000	2.58	1.91	−0.88	−0.03	57	2000	0.04	0.01	−0.05	−0.72
10	2000	2.00	1.63	−0.39	0.01	58	2008	−0.27	−0.38	0.00	0.05
11	2010	0.15	0.03	0.28	0.13	59	2010	−0.15	−0.41	0.62	−0.15
12	2000	0.27	0.06	−0.31	−1.31	60	2000	−0.16	−0.41	−0.60	0.22
13	2005	0.01	0.00	−0.02	0.28	61	2009	3.41	2.55	2.45	0.20
14	2001	0.04	0.01	0.00	3.76	62	2002	4.73	4.04	−0.55	−0.01
15	2000	−0.07	−0.25	−0.28	0.26	63	2010	0.55	0.43	0.22	0.07
16	2010	0.62	0.40	0.54	0.29	64	2003	5.12	4.25	−0.78	−0.02
17	2000	0.08	−0.06	−0.24	−0.21	65	2004	0.17	0.12	0.03	0.07
18	2000	0.00	−0.01	0.00	0.09	66	2006	0.00	0.00	0.00	1.49
19	2001	0.28	0.11	−0.16	−0.12	67	2000	0.04	0.01	−0.04	−0.58
20	2002	0.24	0.14	0.04	0.18	68	2008	0.01	−0.02	0.06	−0.08
21	2001	0.08	−0.01	−0.11	0.03	69	2001	0.40	0.30	−0.24	−0.09
22	2010	0.04	0.01	0.05	0.65	70	2010	0.08	−0.04	0.16	0.09
23	2000	−0.52	−0.81	−0.66	0.09	71	2009	2.03	−0.21	1.22	−0.37
24	2003	0.05	−0.05	0.28	−1.19	72	2000	−2.63	−3.48	−0.77	0.04
25	2010	−0.05	−0.20	0.11	−0.07	73	2005	−0.38	−0.53	0.07	0.01
26	2001	0.17	0.12	−0.07	−0.04	74	2000	−0.21	−0.47	−0.40	0.16
27	2000	6.50	4.16	−5.81	−0.17	75	2000	−0.01	−0.01	0.00	0.05
28	2009	−0.29	−0.37	0.13	−0.03	76	2000	−0.37	−0.45	−0.15	0.04
29	2000	−0.50	−0.76	−0.37	0.07	78	2003	−0.04	−0.07	−0.07	0.15
30	2008	−0.53	−0.77	0.37	−0.02	79	2009	−0.06	−0.10	0.02	0.06
31	2010	−0.61	−1.00	1.06	−0.08	80	2001	0.03	0.02	−0.02	−0.40
32	2008	−0.33	−0.43	0.08	−0.02	81	2010	0.00	−0.01	0.03	0.23
33	2003	−0.06	−0.11	−0.05	0.07	82	2008	0.04	0.01	0.04	−0.21
34	2009	0.06	0.01	0.09	−16.30	83	2000	−0.08	−0.11	−0.05	0.05
35	2008	−0.06	−0.10	0.05	−0.03	84	2000	−4.06	−4.88	−0.58	0.02
36	2010	0.00	−0.01	0.00	0.08	85	2010	−0.92	−1.77	2.08	−0.07

TABLE 17—*Continued*

HSCode	Year	Max	Mean	Change	Growth	HSCode	Year	Max	Mean	Change	Growth
37	2008	−0.04	−0.06	0.06	−0.08	86	2010	0.01	−0.03	0.02	0.50
38	2008	−0.63	−0.77	0.24	−0.03	87	2006	−0.59	−1.68	2.62	−0.08
39	2008	−1.72	−2.04	−0.32	0.02	88	2000	0.06	−0.27	−0.20	−7.22
40	2010	1.33	0.78	1.06	0.22	89	2010	0.00	−0.22	0.46	−0.01
41	2009	−0.33	−0.68	0.22	−0.03	90	2009	−0.26	−0.51	0.19	−0.02
42	2003	0.66	0.56	−0.07	−0.01	91	2004	0.00	0.00	0.00	−0.60
43	2001	0.01	−0.02	0.00	−0.37	92	2009	0.00	−0.01	0.01	−0.10
44	2001	−0.01	−0.24	−0.01	1.43	93	2002	0.00	−0.01	0.00	−0.07
45	2000	0.00	0.00	0.00	0.56	94	2007	2.35	1.73	1.19	0.10
46	2002	0.29	0.21	−0.14	−0.08	95	2010	0.18	0.13	0.06	0.05
47	2002	−0.09	−0.14	0.06	0.02	96	2001	−0.08	−0.14	−0.03	0.08
48	2008	−0.40	−0.59	0.08	0.00	97	2000	0.04	0.00	−0.04	−0.41

Shaded cells are the 5 maximum values in each column (Max, Mean, Change, and Growth). Year is the year of the maximum LFI of the product in the period. Mean is the average of LFI in the period. Change is the change of LFI from 2000 to 2010. Growth is the average annual growth of LFI during the period.

REFERENCES

Amiti, Mary, 1999. Specialization patterns in Europe. *Weltwirtschaftliches Archive* **135(4)**, 573-593.

Arellano, Manuel and Stephen Bond, 1988. Dynamic panel data estimation using DPD-a guide for users, Institute of Fiscal Studies.

Arellano, Manuel and Stephen Bond, 1991. Some tests of specification for panel data: Monte carlo evidence and an application to employment equations. *The Review of Economic Studies* **58(2)**, 277-297.

ASEAN statistics, 2013. Can be found at: http://www.asean.org/news/item/selected-key-indicators

Balassa, Bela, 1965. Trade liberalization and "Revealed" comparative Advantage1. *The Manchester School* **33(2)**, 99-123.

Ballance, Robert H., Helmut Forstner, and Tracy Murray, 1987. Consistency tests of alternative measures of comparative advantage. *The Review of Economics and Statistics*, 157-161.

Ballance, Robert H., Helmut Forstner, and Tracy Murray, 1985. On measuring comparative advantage: A note on Bowen's indices. *Review of World Economics* **121(2)**, 346-350.

Bandyopadhyay, Subhayu and Suryadipta Roy, 2007. Corruption and trade protection: Evidence from panel data. Federal Reserve Bank of St. Louis. Working Paper No. 2007-022A.

Bhagwati, Jagdish, 1964. The pure theory of international trade: A survey. *The Economic Journal* **74(293)**, 1-84.

Bojnec, Štefan , 2001. Trade and revealed comparative advantage measures. *Eastern European Economics* **39(1)**, 72-98.

Bowen, Harry P., 1983. On the theoretical interpretation of indices of trade intensity and revealed comparative advantage. *Weltwirtschaftliches Archive* **119(3)**, 464-472.

Bugamelli, Matteo and Banca d'Itali, 2001. Il modello di specializzazione internazionale dell'area dell'euro e dei principali paesi europei: Omogeneitá e convergenza Banca d'Italia Rome.

Burenstam Linder, S., 1961. An Essay on Trade and Transformation. New York NY: Wiley & Sons.

Dixon, Charis, 1991. Southeast Asia in the world-economy. Cambridge: Cambridge University Press.

Fertö, Imre and Hubbard Lionel J., 2003. Revealed comparative advantage and competitiveness in Hungarian agro-food sectors. *The World Economy* **26(2)**, 247-259.

Grubel, Herbert G. and Peter Lloyd, 1975. Intra-industry trade: The theory and measurement of international trade in differentiated products. London: Macmillan.

Haberler, Gottfried V., 1936. Theory of international trade: With its applications to commercial policy. Chicago: University of Chicago Press.

Harkness, Jon and John F. Kyle, 1975. Factors influencing United States comparative advantage. *Journal of International Economics* **5(2)**, 153-165.

Heckscher, Eli F., 1919. The effect of foreign trade on the distribution of income. *Ekonomisk Tidskrift* **21**, 1-32.

Helpman, Elhanan, 1981. International trade in the presence of product differentiation, economies of scale and monopolistic competition: A chamberlin-heckscher-ohlin approach. *Journal of International Economics* **11(3)**, 305-340.

Hillman, Arye L., 1980. Observations on the relation between "revealed comparative advantage" and comparative advantage as indicated by pre-trade relative prices. *Review of World Economics* **116(2)**, 315-321.

Hinloopen, Hinloopen and Charles van Marrewijk, 2001. On the empirical distribution of the balassa index. *Weltwirtschaftliches Archiv* **137(1)**, 1-35.

Hinloopen, Hinloopen and Charles van Marrewijk, C., 2004. Dynamics of Chinese comparative advantage. *American Economic Journal: Macroeconomics* **5**, 26-45.

Hirsch, Seev, 1967. Location of industry and international competitiveness. Oxford: Clarendon Press.

Hirsch, Seev, 1976. An international trade and investment theory of the firm. *Oxford Economic Papers* **28(2)**, 258-270.

World Bank, 2016. http://data.worldbank.org/data-catalog/world-development-indicators

World Bank, 2016. http://wits.worldbank.org/wits/

Lafay, Gerard, 1992. The measurement of revealed comparative advantages. International Trade Modeling. London: Chapman & Hill.

Leontief, Wassily, 1953. Domestic Production and Foreign Trade; the American Capital Position Re-Examined. *Proceedings of the American Philosophical Society* **97(4)**, 332-349.

MacDougall, Gorge, 1951. British and American exports: A study suggested by the theory of comparative costs. Part I. *The Economic Journal* **61(244)**, 697-724.

Marchese, Serafino and Francisco Nadal De Simone, 1989. Monotonicity of indices of "Revealed" comparative advantage: Empirical evidence on Hillman's condition. *Weltwirtschaftliches Archive* **125(1)**, 158-167.

Mátyás, Laszlo, 1998. The gravity model: Some econometric considerations. *The World Economy* **21(3)**, 397-401.

Mátyás, Laszlo, 1997. Proper econometric specification of the gravity model. *The World Economy* **20(3)**, 363-368.

Oelgemöller, Jens and Andreas Westermeier, 2009. RCAs within Western Europe, CeGE Discussion. Paper, No. 79

Ohlin, Bertil, 1935. Interregional and international trade. Cambridge, MA: Hrvard University Press.

Ohno, Kenichi, 2002. The East Asian experience of economic development and cooperation. Background Paper for the RIEMI/METI Seminar in the World Summit on Sustainable Development in Johannesburg on 1.

Porter, Michael E., 1990. The competitive advantage of nations. *Harvard Business Review* **68(2)**, 73-93.

Posner, Michael V., 1961. International trade and technical change. *Oxford Economic Papers* **13(3)**, 323-341.

Proudman, James and Stephen Redding, 2000. Evolving patterns of international trade. *Review of International Economics* **8(3)**, 373-396.

Ricardo, David, Gonner ECK and Qizen Li, 1819. The principles of political economy and taxation: World Scientific. Page 22-98.

Samuelson, Paul A., 1948. International trade and the equalization of factor prices. *The Economic Journal* **58(230)**, 163-184.

Stolper, Wolfgang F. and Paul A. Samuelson, 1941. Protection and real wages. *The Review of Economic Studies* **9(1)**, 58-73.

Tan, Lin-Yeok, 1992. A heckscherohlin approach to changing comparative advantage in Singapore's manufacturing sector. *Weltwirtschaftliches Archive* **128(2)**, 288-309.

Thede, Susanna and Nils-Ake Gustafson, 2012. The multifaceted impact of corruption on international trade. *The World Economy* **35(5)**, 651-666.

Vernon, Raymond, 1966. International investment and international trade in the product cycle. *The Quarterly Journal of Economics*, 190-207.

Viner Jacob, 1937. Studies in the Theory of International Trade. New York: Harper & Brothers.

Windmeijer, Frank, 2005. A finite sample correction for the variance of linear efficient two-step GMM estimators. *Journal of Econometrics* **126(1)**, 25-51.

Yue, Changjun and Ping Hua, 2002. Does comparative advantage explains export patterns in china? *China Economic Review* **13(2)**, 276-296.