広島経済大学経済研究論集
第32巻第１号　2009年６月

資　料

トリ・ウィドド氏学位授与報告

報 告 番 号	甲第６号
学 位 の 種 類	博士（経済学）
授与の年月日	平成21年３月18日
学位論文題名	Shift in Comparative Advantage, Dynamic Market and Purchasing Power Parity in the East Asia

Summary

Background

Since the beginning of multilateral trade system, many regional trade agreements (RTAs) and regional economic integrations have been achieved, for examples the European Union (EU), the North American Free Trade Agreement (NAFTA), the *Mercado Común del Sur* (MERCOSUR, Southern Common Market), the Association of South East Asian Nations (ASEAN) - Free Trade Area (AFTA), etc. The achievements of RTAs and regional economic integrations, to some extent, have brought positive as well as negative implications that might appear in the forms of trade creation and trade diversion for the non-member countries (Viner, 1950; McCarthy, 2006). The East Asian region was noticeably late in proceeding to the *de jure* (legal) regional economic integration, even though the *de facto* (factual) economic integration is sometimes claimed (Fouquin *et al.,* 2006). Remarkable trade and investment activities, especially between Japan and China, as well as Japan and the individual ASEAN countries have increased significantly. RTAs in the East Asia did not exist until the ASEAN (only among the founding members: Indonesia, Malaysia, the Philippines, Singapore, and Thailand) reached the Preferential Trade Agreements (PTAs) in 1977.

The RTAs, regional economic integrations, bilateral trade agreements (BTAs), and other international strategic alliances have affected countries' dynamic comparative advantages and specialization. Whether there are systematic changes in the comparative advantage and specialization of trade in the East Asian countries has been a crucial issue for the future development of the East Asian economic integration. Following a formation of "flying geese" (FG)[1], it might be commonly believed that the systematic shifts in comparative advantage exist. The shifts have been in the most

standardized, labor-intensive manufactures from Japan to the Newly Industrialized Economies (NIEs) and then to the ASEAN4 (Malaysia, Indonesia, Thailand and the Philippines) and so on (Kojima, 2000; Ozawa, 2001, 2006; Kasahara, 2004; Kwan, 2002).

One of the most important issues in the international trade is exchange rate. Indeed, the nominal exchange rate determines the competitiveness of a country. The law of one price states that in competitive markets, free of transportation costs and no official barrier to trade (such as tariffs and non-tariff barriers), an identical commodity in different countries will have the same price when it is valued in the same currency. Purchasing Power Parity (PPP) is a simple empirical preposition that once converted to a common currency; national price levels should be equal. The theory of PPP explains the movements in the exchange rates between two countries and their changes in price levels (Krugman and Obstfeld, 2000:394). In spite of the relatively large body of literature examining the PPP theory for developed countries, relatively few researches have studied the proposition for developing countries which have various distinctive international policies and degrees of liberalization such as the East Asian countries.

Research Questions

The main aim of this thesis is to answer several critical questions related with the economic integration, comparative advantages and Purchasing Power Parity (PPP) of the East Asian economies:

1. The first established economic integration in the East Asia is the ASEAN. How has the *de jure* economic integration changed? Has the focus of the ASEAN changed, parallel with the development of international regionalism?
2. In fact, the ASEAN member countries' factors endowments are relatively similar. Theoretically, they will also have similarities in comparative advantage. There have been skeptical views on the development of the ASEAN because the substitute relationship among the members exists. How are the major trade trends in the ASEAN region? Has the intra-regional trade in the ASEAN region increased significantly?
3. Foreign direct investment (FDI) can change the relative endowment of factors. Accordingly, the country's comparative advantage can be dynamic. How have the patterns of comparative advantage of the East Asian countries shifted ?
4. The Heckscher-Ohlin (HO) theory suggests that a country will have comparative advantage on commodities produced with the country's abundant factors of production. How have the endowment of factors determined the countries' comparative advantage?
5. To what directions have the trade specialization and trade patterns of the East Asian countries been going on? In other words, have they de-specialized in their trade and converged in their patterns of comparative advantage?
6. One very famous theory in the "catching-up" process of economies is the flying geese (FG) pattern (in Japanese: ganko keitai): imports-domestic production-exports-reverse imports ("M-P-E-M"). Does the FG pattern exist in the East Asia?
7. Regionalism and economic integration affect countries' export performance. What are the dynamic markets for the East Asian countries' exports?
8. How are the intra-industry trade and the intra-regional trade in the East Asia going on? Has the intra-industry trade in the intra-regional trade become significant compared with the inter-industry trade in the region?
9. Does purchasing power parity (PPP) not hold in the strong sense in the case of East-Asian

countries?

10. Finally, this thesis takes Indonesia as a case study. How is the structure of protection in Indonesian manufacturing sector?

Theoretical Framework

Figure 1 and Table 1 show the theoretical framework, analytical tools and case studies for each chapter of this thesis. To make clear analysis, all the ten research questions are broken down into some more specific questions that are presented and answered systematically in the ten chapters (Chapters 2-11). All the ten research-questions can be categorized into the three groups i.e. comparative advantage, dynamic market and exchange rate as depicted in Figure 1. Chapters 4-7 and 11 deal with questions about comparative advantage. Chapter 3, 8 and 9 are related to the dynamic market of East Asian countries' exports. Meanwhile, Chapter 10 is on hypothesis testing on PPP in the cases of the East Asian countries.

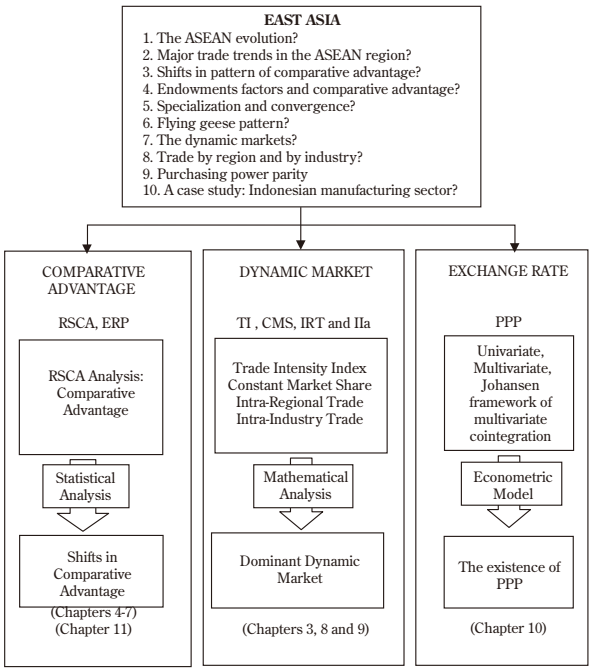


Figure 1. The Research Framework

Some common analytical tools are applied, such as Trade Intensity (TI) index, Revealed Symmetric Comparative Advantage (RSCA), Spearman's rank correlation, Trade Balance Index (TBI), Econometric model, Constant Market Shares (CMS), Intra-regional trade (IRT) and Intra-industry trade (IIa) and Effective Rate of Protection (ERP). However, this thesis contributes to the analytical tools. *First,* this thesis proposes a new method in analyzing convergence of comparative advantage between two countries, i.e. by conducting the stationary test on Spearman's rank correlation coefficients between the two countries' RSCA (Chapter 4). *Second,* this thesis introduces dummy variables (across countries and across industries) in the econometric model that is

Table 1. Analytical Tools and Case Studies

Analytical Tools and Case Studies	Chapters											
	1	2	3	4	5	6	7	8	9	10	11	12
1. Analytical Tools												
- Descriptive statistic		◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	
- TI			◎									
- RSCA				◎	◎	◎	◎				◎	
- Spearman's rank corr.				◎		◎						
- TBI							◎					
- Econometric Model				◎			◎			◎		
- CMS								◎				
- IRT and IIa			◎						◎			
- Mathematical approach					◎			◎				
- ERP											◎	
2. Case Studies												
a. ASEAN		◎	◎	◎								
- Singapore		◎	◎	◎	◎	◎	◎	◎	◎	◎		
- Indonesia		◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	
- Malaysia		◎	◎	◎	◎	◎	◎	◎	◎	◎		
- Thailand		◎	◎	◎	◎	◎	◎	◎	◎	◎		
- the Philippines		◎	◎	◎	◎	◎	◎	◎	◎	◎		
- Brunei D.		◎	◎									
- Vietnam		◎	◎									
- Lao		◎	◎									
- Myanmar		◎	◎									
- Cambodia		◎	◎									
b. North East Asia												
- Japan				◎	◎	◎	◎	◎	◎	◎		
- Korea				◎	◎	◎	◎	◎	◎	◎		
- China				◎	◎	◎	◎	◎	◎	◎		
- Hong Kong								◎	◎	◎		

Notes: TI = Trade Intensity Index, RSCA = Revealed Symmetric Comparative Advantage, TBI = Trade Balance Index, CMS = Constant Market Share, IRT = Intra-Regional Trade, IIa = Intra-Industry Trade, ERP = Effective Rate of Protection, ◎ is applied.

commonly applied to examine countries' dynamic specialization (Laursen, 1998; Wörz, 2005) (Chapter 6).

Third, by combining RSCA and TBI, this thesis makes a new analytical tool, namely, 'products mapping', which is appropriate for analyzing the FG pattern (Chapter 7). *Fourth,* this thesis refines the CMS method by Leamer and Stern (1970) (Chapter 8). *Fifth,* this thesis modifies the formula of inter- and intra-industry trade by Grubel and Lloyd (1975) to deal with the phenomena of inter- and intra-regional trade (Chapter 9). This modification formula will be referred to as Regional Intra-Industry Trade index.

Chapter 2 The Evolution of ASEAN

Chapter 2 shows the evolution of ASEAN. It might be argued that the ASEAN's interest has shifted from international-political issues to economic issues, especially on trade and investment. Institutional approach is mainly employed in this chapter to show the evolution. Historically, the ASEAN was established concerning the regional stability and political issues. However, parallel with the proliferation of economic regionalism in the world and the period of active trade liberalization in the 1980s and 1990s, the ASEAN has pushed economic cooperation forward.

The first effort on it was the establishment of the ASEAN Preferential Trading Arrangements (ASEAN-PTA). However, this initiative of forming the ASEAN-PTA was disappointing due to some factors such as the limited coverage of the PTA, the nature of intra-regional structure, which was competitive rather than complementary, and the diminishing urgency of pursuing the task because of

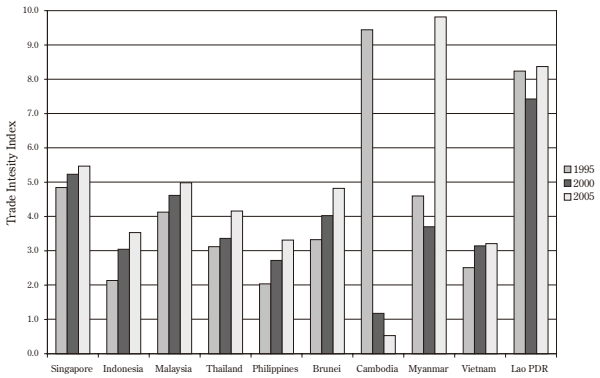
the continued growth and development in the region. The further concrete effort toward regionalism was the ASEAN Free Trade Area (AFTA) launched in 1992 by the ASEAN. The AFTA will be created through the Common Effective Preferential Tariff (CEPT) Scheme. The schedule is flexibly managed, depending on the preferences of different countries over range of sectors.

The relative similarities in natures of the ASEAN's members, to some extent, give positive and negative implications. Brunei Darussalam and Singapore are the richest members in terms of GDP per capita but they do not have many labors, natural resources, etc. In contrast, Indonesia is the biggest member in term of population but she does not have much capital, good services and so on. As result, there is no dominant member which may be the 'core' member steering dominantly the institution. The ASEAN has frequently been criticized as an indulgent institution directed by weak peer pressure. However, it has proved to be a very successful model of economic cooperation and economic integration for developing countries.

Chapter 3 Major Trade Trends in the ASEAN Region

The major trade trends in the ASEAN region are represented in Chapter 3. The establishment of the ASEAN Free Trade Area (AFTA) is proposed to increase the intra-regional trade. This chapter is addressed to answer some more detailed critical questions: What are the geographic destinations of the ASEAN exports? Does the country size matter in the intra-ASEAN trade? Which countries are more dependent upon the intra-ASEAN trade? How far have the geographic patterns of regional trade dependence changed? How intense is the intra-ASEAN trade? Statistic descriptive and static comparative methods such as share analysis, Pearson correlation and trade intensity (TI) index are used to examine the intra-regional trade and geographical export destinations. The standard TI index by Drysdale and Garnout (1982) is formulated as follows:

$$TI_{jk} = \frac{\left[\frac{x_{jk}}{X_j}\right]}{\left[\frac{x_{wk}}{X_w}\right]_t} \qquad (1)$$



Source: DOTS-IMF (1998, 2006), *author's calculation.*

Figure 2. Trade Intensity Index of the ASEAN

where TI_{jk} is trade intensity index of country j for export destination k; x_{jk} and x_{wk} country j's and world's exports to k, respectively. An index of more (less) than unity is interpreted as indicating a bilateral trade flow is larger (smaller) than expected given the partner country's importance in world trade. Figure 2 shows the trade intensity index of the ASEAN countries.

This chapter concludes that the geographic destination of the ASEAN countries' exports has slightly changed. Although Japan, the EU and the NAFTA are still dominant trade partners, the share of the ASEAN countries' exports to those trade partners decreased for 1995-2005. China, Hong Kong and Taiwan have significantly become a more important geographic destination of the ASEAN countries' export. The ASEAN5 countries (Singapore, Malaysia, Thailand, Indonesia and the Philippines) have dominated the intra-regional trade in ASEAN region. There is a positive relationship between the size of country and the share of intra-regional trade in the ASEAN region. The intra-regional trade in the ASEAN region has been larger (intense) than expected given the ASEAN's importance in world trade, except Cambodia, which was currently very much engaged with the US market.

Chapter 4 Shifts in Comparative Advantage

Chapter 4 analyzes the shifts in pattern of comparative advantage of the ASEAN5[2] (Singapore, Indonesia, Malaysia, Thailand and the Philippines), Japan, Korea and China (abbreviated as the ASEAN+3, from now on) by applying statistical method. This chapter is addressed to answer some particular questions: in what sorts of exported products do the ASEAN+3 have comparative advantages? How far have comparative advantages of the ASEAN+3 shifted dynamically? Does the ASEAN's pattern of comparative advantages follow a sequential change similar to that of Japan, China, and Korea?

An indicator of comparative advantage, namely Revealed Symmetric Comparative Advantage (RSCA) by Laursen (1998) is applied in this chapter as well as the next three chapters. The RSCA index is a simple transformation of Revealed Comparative Advantage (RCA) or Balassa index (Balassa, 1965). The RCA and RSCA indices are formulated as follow:

$$RCA_{ij} = (x_{ij} / x_{in}) / (x_{rj} / x_{rn}) \quad (2)$$

$$RSCA_{ij} = (RCA_{ij} - 1) / (RCA_{ij} + 1) \quad (3)$$

where RCA_{ij} denotes revealed comparative advantage of country i for group of products

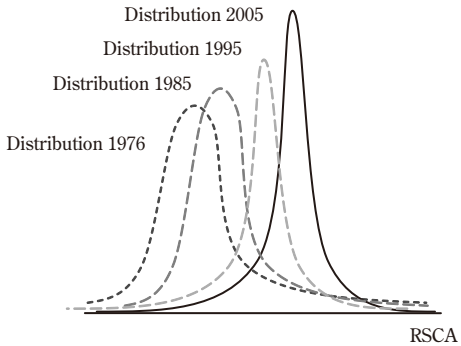
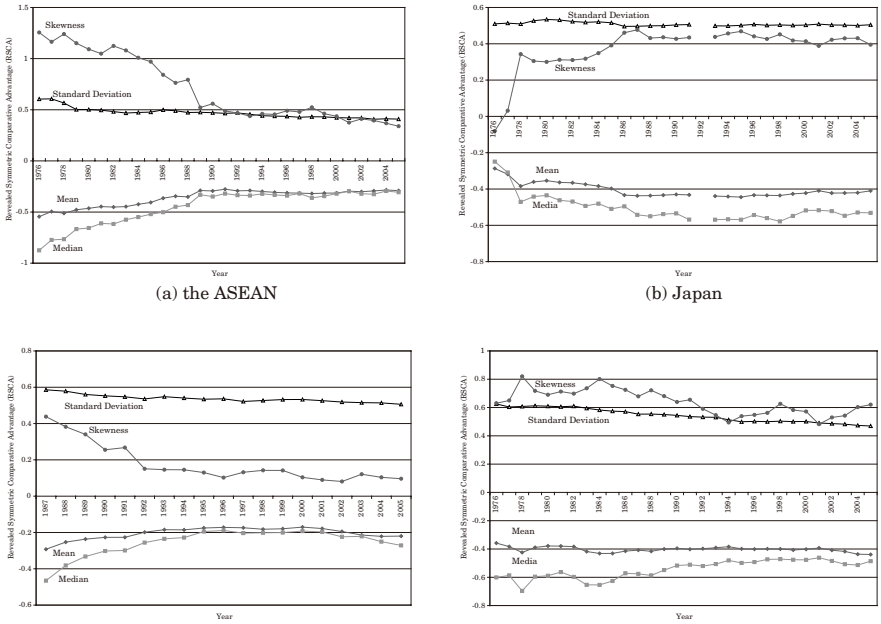


Figure 3. Shifting Comparative Advantage

(Standard International Trade Classification, SITC) j. x_{ij} stands for total exports of country i in group of products (SITC) j. Subscript r denotes all countries without country i, and subscript n refers to all groups of products (SITC) excepting group of product j.

Descriptive statistics (mean, median, standard deviation and correlation) are applied to summarize the RSCA across commodities (Standard International Trade Classification, SITC). Then, we might make a hypothesis that the ASEAN, Japan, Korea or China have more specialized or more concentrated on higher comparative advantage products over periods of observation (shown by higher value of means; smaller standard deviation and smaller value of skweness over time) as presented by Figure 3.

Figure 4 shows the empirical results. The increase in overall comparative advantage together with the decrease in the standard deviation implies that the increase in overall comparative advantage is encouraged by the higher increase in comparative advantage of products, which had no or lower comparative advantage in the past. The ASEAN, China and Korea may have a trade-off between specialization based on the existing comparative advantage (in low technology groups of products) and shifting to the other products in which they currently lack a comparative advantage, but may acquire such an advantage in the future as a result of the potential for productivity growth (in high technology groups of products which Japan has specialized in).



Source: UN-COMTRADE, *author's calculation.*

Figure 4. Trend in Mean, Median, Standard Deviation and Skewness of Comparative advantages

This chapter also applies statistical hypothesis test procedure of correlation on the RSCA index to examine the shifts in the patterns of comparative advantage. The degree of linear association between the two series of RSCA can be compared by the Spearman's rank correlation coefficient,

which is given as follows (Leu, 1998; James and Movshuk, 2003; Gujarati, 2000):

- Across periods (years):

$$\rho_{s,Ct_a,Ct_b} = 1 - 6\left[\frac{\sum_{i=1}^{n} d_{R_{it}}^2}{n(n^2-1)}\right] \tag{4}$$

- Across countries:

$$\rho_{s,Ct_a,Ct_b} = 1 - 6\left[\frac{\sum_{i=1}^{n} d_{R_{it}}^2}{n(n^2-1)}\right] \tag{5}$$

Where:

ρ_{s,Ct_a,Ct_b} = the Spearman's rank correlation coefficient between county C's RSCA at time t_a (symbol: Ct_a) and country C's RSCA at time t_b (symbol: Ct_b).

ρ_{s,Ct_a,CI_b} = the Spearman's rank correlation coefficient between country C's RSCA at time t_a (symbol: Ct_a) and country I's RSCA at time t_b (symbol: It_b).

$d_{Rj}^2 = (R_{RSCA_{jC,ta}} - R_{RSCA_{jC,tb}})^2$ for across periods (years).

$d_{Rj}^2 = (R_{RSCA_{jC,ta}} - R_{RSCA_{jI,tb}})^2$ for across countries.

$R_{RSCA_{jc.ta}}$ = the rank of country C's RSCA of group of products j at time t_a

$R_{RSCA_{jc.ta}}$ = the rank of country C's RSCA of group of products j at time t_b

$R_{RSCA_{jc.ta}}$ = the rank of country I's RSCA of group of products j at time t_b

n is number of observation groups of products (i.e. 237 SITC)

t_a and t_b is time

Table 2. Spearman's Rank Correlation Coefficient across Periods

		ASEAN Comparative Advantage			
		1976	1985	1995	2005
ASEAN Comparative Advantage	1976	1.00	0.54*	0.40*	0.24*
	1985	0.54*	1.00	0.76*	0.61*
	1995	0.40*	0.76*	1.00	0.83*
	2005	0.24*	0.61*	0.83*	1.00

(a)

		Japan Comparative Advantage			
		1976	1985	1995	2005
Japan Comparative Advantage	1976	1.00	0.92*	0.86*	0.82*
	1985	0.92*	1.00	0.92*	0.84*
	1995	0.86*	0.92*	1.00	0.95*
	2005	0.82*	0.84*	0.95*	1.00

(b)

		Korea Comparative Advantage			
		1976	1985	1995	2005
Korea Comparative Advantage	1976	1.00	0.78*	0.56*	0.34*
	1985	0.78*	1.00	0.78*	0.57*
	1995	0.56*	0.78*	1.00	0.82*
	2005	0.34*	0.57*	0.82*	1.00

(c)

		China Comparative Advantage			
		1987	1995	2005	
China Comparative Advantage	1987	1.00	0.68*	0.48*	
	1995	0.68*	1.00	0.81*	
	2005	0.48*	0.81*	1.00	

(d)

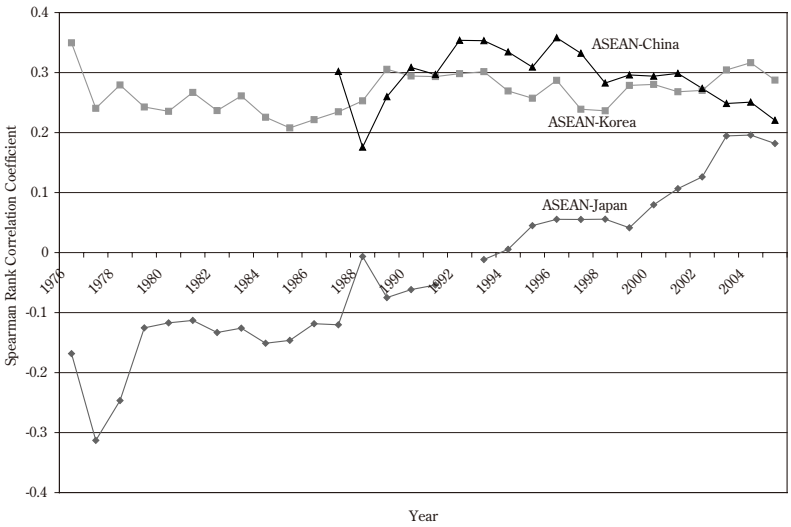
Note: * significant at 1 percent level of significance

Source: UN-COMTRADE, *author's calculation.*

The values of Spearman's rank correlation coefficients range from -1 (a perfect negative relationship) to +1 (a perfect positive relationship). Within a specific country, it is applied across periods to analyze the dynamic shift in comparative advantage. If the correlation is closer to one (+1), the shift in comparative advantage is less dynamic. In contrast, if it is closer to minus one (-1), the shift in comparative advantage is more dynamic. Table 2 shows the empirical results. All countries exhibit slower rate of change in the pattern of comparative advantage.

The rank correlation is also applied across countries i.e. the ASEAN, Japan, Korea and China to see the association of the pattern of comparative advantage. Higher positive value of Spearman's correlation coefficient indicates stronger competition between two countries in the export market (more similar pattern of comparative advantage), *vice versa.*

Figure 5 shows trends of the Spearman's rank correlation coefficient between the ASEAN's comparative advantage and that of Japan, Korea as well as China. The coefficients of the ASEAN-China and the ASEAN-Korea were positive during the periods of observation. In the case of the ASEAN-Japan, up to 1994 there had been negative values in the coefficients correlation, which implied complementary relationship in the patterns of comparative advantage. However, since 1995 the correlation coefficients have become positive and approached 0.2 (statistically significant) in 2003.



Source: UN-COMTRADE, *author's calculation.*

Figure 5. Spearman's Rank Correlation Coefficient the ASEAN+3

An interesting issue regarding the relationship of comparative advantage pattern between the ASEAN and Japan; the ASEAN and China; or the ASEAN and Korea is whether a long term equilibrium relationship exists or not. In other words, do they have a certain level of similarity in their patterns of comparative advantage in the long run? This chapter applies a stationary test on the correlation series, namely Augmented Dickey-Fuller (ADF) test. The ADF test constructs a parametric correction of the typical Dickey-Fuller test for highest-order correlation by assuming that the series (in this research the Spearman's rank correlation coefficients, ρ) follows autoregressive model with order p -denoted as AR(p)- process and adding lagged difference terms of the dependent

Table 3. Stationary Test on Pattern of Comparative Advantage

Pattern of Comparative Advantage	ADF Test Statistic	Level of Significance	Critical Value	Conclusions
ASEAN-Japan	-3.11	1%	-4.37	Non-stationary （No long run equilibrium in the correlation of comparative advantage pattern）
		5%	-3.60	Non-stationary （No long run equilibrium in the correlation of comparative advantage pattern）
		10%	-3.24	Non-stationary （No long run equilibrium in the correlation of comparative advantage pattern）
ASEAN-Korea	-2.36	1%	-4.36	Non-stationary （No long run equilibrium in the correlation of comparative advantage pattern）
		5%	-3.59	Non-stationary （No long run equilibrium in the correlation of comparative advantage pattern）
		10%	-3.23	Non-stationary （No long run equilibrium in the correlation of comparative advantage pattern）
ASEAN-China	-2.80	1%	-4.73	Non-stationary （No long run equilibrium in the correlation of comparative advantage pattern）
		5%	-3.76	Non-stationary （No long run equilibrium in the correlation of comparative advantage pattern）
		10%	-3.32	Non-stationary （No long run equilibrium in the correlation of comparative advantage pattern）

Source: UN-COMTRADE, *author's calculation.*

variable ρ_t to the right hand side of original test regression (Enders, 1995; Gujarati, 2000), as described as follows:

$$\Delta\rho_t = \beta_0 + \beta_1\rho_{t-1} + \sum_{i=1}^{p}\alpha_i\Delta\rho_{t-1} + \delta t + \varepsilon_t \qquad (6)$$

where t and ε_t are time and the error term, respectively. The ρ_t is non-stationary if we accept the hypothesis (Ho) saying that $\beta_1=0$. In contrast, the ρ_t is stationary if we reject the hypothesis (Ho) saying that $\beta_1=0$. For testing the hypothesis, it follows conventional Student's t-distribution $t_{\beta 1}=\dfrac{\beta_1}{se(\beta_1)}$ and it is compared with the MacKinnon (1991, 1996) critical value.

Table 3 represents the results of the ADF stationary tests on correlation of comparative advantage between the ASEAN and Japan; the ASEAN and Korea; as well as the ASEAN and China. Since the ADF test statistics more than the chosen critical values (1 percent, 5 percent, and 10 percent), we accept the hypothesis (Ho) saying that the correlation coefficient series (ASEAN-Japan; ASEAN-Korea and ASEAN-China) are non stationary series. This research, therefore, indicates that the comparative advantage pattern should be seen in dynamic sense.

Chapter 5 Factor Endowments and Comparative Advantage

Chapter 5 discusses a more theoretical issue on the relation between a country's factor endowments and its comparative advantage. Factor endowments play important roles in international trade. This chapter describes the Heckscher-Ohlin theory in the general equilibrium (GE) framework. In the H-O model, there are nine strict assumptions (Appleyard and Field, 2001): (1) there are two countries, (2) technology is identical in both countries; that is, production functions are the same in both countries, (3) production function is characterized by constant return to scale (CRS)

for both commodities in both countries, (4) the two commodities have different factor intensities, and the respective commodity factor intensities are the same for all factor price ratios, (5) tastes and preferences (utility functions) are the same in both countries. In addition, there are homothetic tastes and preferences, (6) markets are in perfect competition in both countries, (7) factors of production are perfectly mobile within each country and immobile between two countries, (8) transportation costs are zero, (9) there are no trade barriers or any policy restrictions on the movements of goods between two countries or interfering with the market determination of prices and output. By using numerical examples, this chapter shows that the H-O theorem does not necessarily hold when assumptions on production and consumption are violated.

Countries in the East Asian region have large discrepancies in the factor endowments. By applying Revealed Symmetric Comparative (RSCA) index, this chapter shows that China, Indonesia and Thailand have comparative advantage in *unskilled labor*-intensive industry, meanwhile only Japan has comparative advantage in *technology*-intensive industry for the last two decades.

Chapter 6 Dynamic Specialization and Convergence in Trade Pattern

The dynamic specialization and convergence in trade patterns of the East Asian countries are represented in Chapter 6. Theoretically, there are four possible combinations between trade specialization and trade-pattern convergence i.e. more-specialized together with diverging trade patterns (Case 1); less-specialized together with converging trade patterns (Case 2); more-specialized together with converging trade patterns (Case 3); and less-specialized together with diverging trade patterns (Case 4). The East Asian region consists of diverse economies. Accordingly, one main question intended to answer is: in which cases East-Asian economies are laid? In Cases 1, 2, 3 or 4?

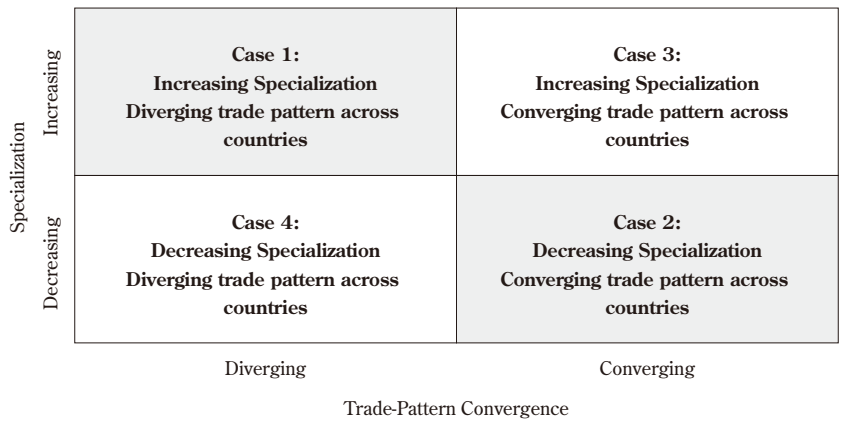


Figure 6. Four Possible Combinations: Specialization and Convergence

An econometric model is used to examine the dynamics of comparative advantage across countries and across products. The following simple regression model is usually used to estimate the dynamics of comparative advantage (Laursen, 1998; Wörz, 2005):

$$RSCA_{ij,T} = \alpha + \beta\, RSCA_{ij,0} + \varepsilon_{ij} \qquad (7)$$

where $RSCA_{ij,T}$ and $RSCA_{ij,0}$ are Revealed Symmetric Comparative Advantage of country i in product j for years T and 0, respectively. The coefficient β indicates whether existing comparative advantage or specialization patterns have been reinforced or not during the observation. If β is not significantly different from one (β=1), there is no change in the overall degree of specialization. β>1 indicates increased specialization of the respective country. 0<β<1 indicates despecialization -that is, a country has gained comparative advantage in industries where it did not specialize and has lost competitiveness in those industries where it was initially heavily specialized (Wörz, 2005). In the event of $\beta \leq 0$, no reliable conclusion can be drawn on purely statistical grounds; the specialization pattern is either random, or it has been reversed.

It might be believed that the dynamics in specialization across countries and across industries are different. To examine this issue in the East Asian countries, this chapter adds dummy variables for countries (D_i^c) into equation (7)[3]:

$$RSCA_{ij,T} = \alpha + \beta\, RSCA_{ij,0} + \sum_{i=1}^{7} \gamma_i (D_i^C RSCA_{ij,0}) + \omega_{ij} \qquad (8)$$

Where $RSCA_{ij,T}$ and $RSCA_{ij,0}$ are Revealed Symmetric Comparative Advantage for product j of country i at year T and 0, respectively, ω_j are white noise error terms, α, β, γ_i are constants and parameters estimated and D_i^c is dummy variable for countries. Since there are eight countries to be compared, there must be seven country dummy variables:

$$D_1^C = \begin{cases} 1 & \text{Korea} \\ 0 & \text{Otherwise} \end{cases}$$
$$D_2^C = \begin{cases} 1 & \text{China} \\ 0 & \text{Otherwise} \end{cases}$$
$$D_3^C = \begin{cases} 1 & \text{Singapore} \\ 0 & \text{Otherwise} \end{cases}$$
$$D_4^C = \begin{cases} 1 & \text{Indonesia} \\ 0 & \text{Otherwise} \end{cases}$$
$$D_5^C = \begin{cases} 1 & \text{Malaysia} \\ 0 & \text{Otherwise} \end{cases}$$
$$D_6^C = \begin{cases} 1 & \text{Thailand} \\ 0 & \text{Otherwise} \end{cases}$$
$$D_7^C = \begin{cases} 1 & \text{Philippine} \\ 0 & \text{Otherwise} \end{cases}$$

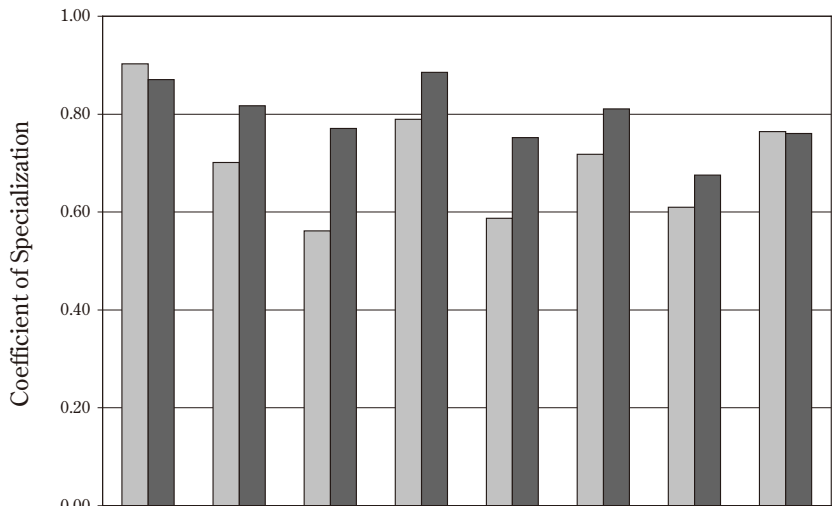
Table 4 and Figure 7 show the estimation result of the econometric model (8). All coefficients of countries dummy variable in both periods 1985-1995 and 1995-2005 are negative (except country dummy 3 (Singapore=1) for 1995-2005) and statistically significant (except country dummy 1 (Korea=1) and country dummy 5 (Malaysia=1) for 1995-2005). All countries exhibit decreases in specialization since the coefficients of specialization are statistically less than one.

Dynamic specialization might be different across industries. It might be generally believed that comparative advantage in primary and natural-resource intensive industry changes very little compared with unskilled-labor intensive industry, technology-intensive industry and human-capital intensive industry. To deal with this issue, a little modification of econometric model (7) is done by adding dummy variables for industries D_i^p as follows:

Table 4. Estimation Result: Specialization across Countries

Variable	Periods			
	1985-1995		1995-2005	
	Coefficient	Standard Error	Coefficient	Standard Error
Constant	-0.071*	0.016	-0.069*	0.013
Specialization （Japan）	0.903*	0.023	0.871*	0.022
Country Dummy 1 （Korea = 1）	-0.201*	0.040	-0.053	0.034
Country Dummy 2 （China = 1）	-0.341*	0.049	-0.100**	0.040
Country Dummy 3 （Singapore = 1）	-0.113**	0.043	0.015	0.029
Country Dummy 4 （Indonesia = 1）	-0.315*	0.040	-0.118*	0.031
Country Dummy 5 （Malaysia = 1）	-0.185*	0.038	-0.060	0.026
Country Dummy 6 （Thailand = 1）	-0.293*	0.048	-0.195*	0.038
Country Dummy 7 （Philippine = 1）	-0.138*	0.039	-0.110*	0.041
R-squared	0.554		0.676	
Durbin-Watson Statistic	1.514		1.650	
F-statistic	289.233		485.625	
Method of estimation	Newey-West HAC Standard Errors and Covariance		Newey-West HAC Standard Errors and Covariance	

Note: *,**,*** are significant at 1 percent, 5 percent and 10 percent level of significance, respectively. HAC is Heteroscedasticity and Autocorrelation Consistent Covariance.
Source: UN-COMTRADE, *author's calculation.*



	Japan	Korea	China	Singapore	Indonesia	Malaysia	Thailand	Philippine
1985-1995	0.90*	0.70*	0.56*	0.79*	0.59*	0.72*	0.61*	0.76*
1995-2005	0.87*	0.82*	0.77*	0.89*	0.75*	0.81*	0.68*	0.76*

Note: *,**,*** are significant at 1 percent, 5 percent and 10 percent level of significance, respectively. Source: UN-COMTRADE, *author's calculation.*

Figure 7. Coefficient of Specialization

$$RSCA_{j,T} = \phi + \eta RSCA_{j,0} + \sum_{k=1}^{4} \delta_k (D_k^p RSCA_{j,0}) + \varepsilon_j \quad (9)$$

where $RSCA_{j,T}$ and $RSCA_{j,0}$ are Revealed Symmetric Comparative Advantage for product j at years T and 0, respectively, ε_j are white noise error terms, α, β, δ_k, are constant and estimated parameters; D_i^p are dummy variables for industries. Since there are five categories of industries, four country dummy variables are set:

$$D_1^P = \begin{cases} 1 & \text{Natural – resource int ensive industry} \\ 0 & \text{Otherwise} \end{cases}$$

$$D_2^P = \begin{cases} 1 & \text{Unskilled – labor int ensive industry} \\ 0 & \text{Otherwise} \end{cases}$$

$$D_3^P = \begin{cases} 1 & \text{Techno log y int ensive industry} \\ 0 & \text{Otherwise} \end{cases}$$

$$D_4^P = \begin{cases} 1 & \text{Human – capital int ensive industry} \\ 0 & \text{Otherwise} \end{cases}$$

Table 5 and Figure 8 show the estimation results of the econometric model (9). All industries represent decreases in their specialization since the coefficients of specialization statistically are less than one. In general, comparing the two periods, despecialization in 1985-1995 was more dynamic than despecialization in 1995-2005. *Primary* industries and *natural resource*-intensive industries had higher coefficients of specialization.

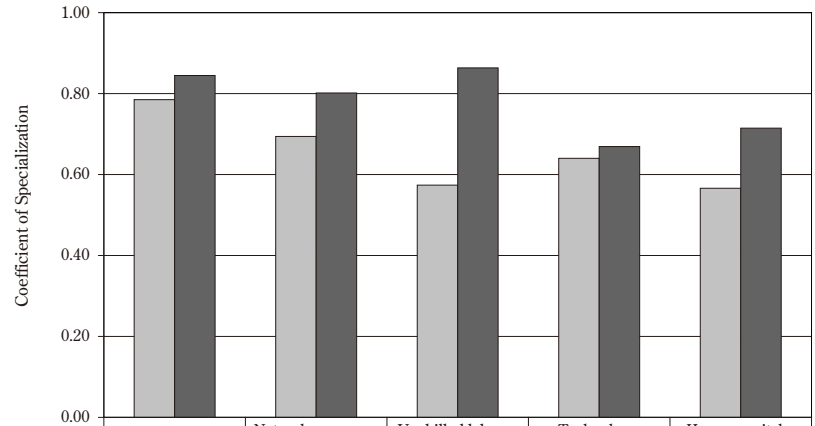
This chapter also applies the Spearman's rank correlation to examine convergence of the specialization patterns in the East Asia. Figure 9 exhibits the trend in the correlation of specialization patterns between Japan and other countries. It can be firmly stated that there have been a nice positive trend in the correlation. It implies that the all countries' patterns of specialization have become similar with that of Japan. In other words, there is convergence in the patterns of specialization.

Some conclusions are withdrawn. *First,* all countries show despecialization with differences in speed. It implies that all East Asian countries have boosted products with low comparative advantage in the past, to have relatively higher comparative advantage in the future. China, Thailand and Indonesia have more dynamic in their despecialization. *Second,* the East Asian countries have also

Table 5. Estimation Result: Specialization across Products

Variable	Period			
	1985-1995		1995-2005	
	Coefficient	Standard Error	Coefficient	Standard Error
Constant	-0.081*	0.016	-0.078*	0.013
Specialization （Primary）	0.785*	0.024	0.845*	0.017
Product Dummy 1 （Natural-resource）	-0.091**	0.042	-0.043	0.029
Product Dummy 2 （Unskilled-labor）	-0.211*	0.073	0.019	0.036
Product Dummy 3 （Technology）	-0.145*	0.033	-0.176*	0.027
Product Dummy 4 （Human-capital）	-0.219*	0.034	-0.130*	0.032
R-squared	0.548		0.679	
Durbin-Watson Statistic	1.497		1.657	
F-statistic	453.195		791.010	
Method of estimation	Newey-West HAC Standard Errors and Covariance		Newey-West HAC Standard Errors and Covariance	

Note: *,**,*** are significant at 1 percent, 5 percent and 10 percent level of significance, respectively. HAC is Heteroscedasticity and Autocorrelation Consistent Covariance.
Source: UN-COMTRADE, *author's calculation.*

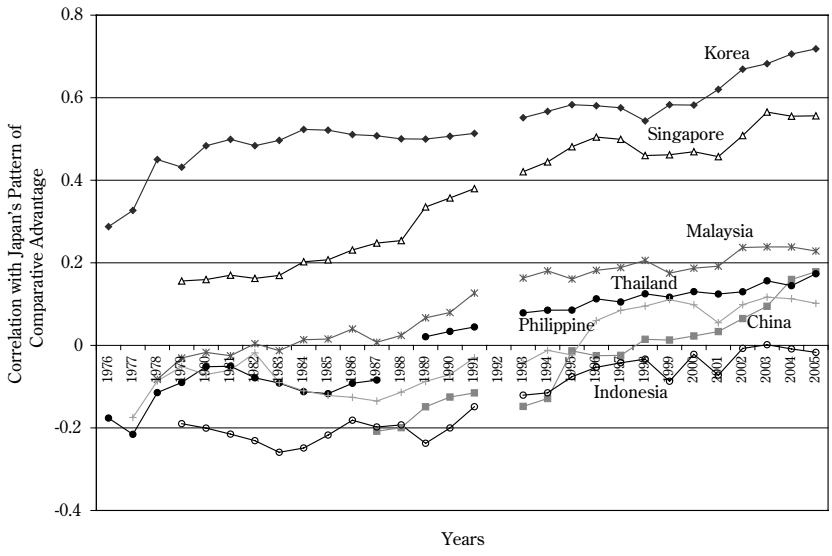


	Primary Products	Natural-resource Intensive Products	Unskilled-labor Intensive Product	Technolgy Intensive Products	Human-capital Intensive Products
1985-1995	0.79*	0.69*	0.574*	0.64*	0.566*
1995-2005	0.84*	0.80*	0.86*	0.67*	0.71*

Note: *,**,*** are significant at 1 percent, 5 percent and 10 percent level of significance, respectively. Source: UN-COMTRADE, *author's calculation.*

Figure 8. Coefficient of Specialization: Across Products

shown despecialization across industries. *Human capital*-intensive industries represent most dynamic despecialization during 1985-1995 compared with the other industries. Currently, *technology*-intensive industries have most dynamic despecialization. For all industries, despecialization in period 1985-1995 was more dynamic than that in period 1995-2005.



Source: UN-COMTRADE, *author's calculation.*

Figure 9. Trends in Correlation of Specialization Pattern between Japan and Individual Countries

Chapter 7 'Flying Geese' and 'Products Mapping'

Chapter 7 analyzes the comparative advantage of the ASEAN+3 countries on factor intensity classification i.e. *primary*-products, natural *resource*-intensive products, *unskilled labor*-intensive products, *human capital*-intensive products and *technology*-intensive products. To investigate the existence of FG pattern in the East Asia, this chapter proposed an analytical tool namely "products mapping" This tool combines the RSCA and Trade Balance Index (TBI). The TBI is formulated as follows:

$$TBI_{ij} = (X_{ij} - m_{ij}) / (X_{ij} + m_{ij}) \quad (10)$$

By combining RSCA with TBI, there are four categories which a specific product might lie in i.e.: having comparative advantage and having specialization; having comparative advantage but no specialization; having specialization but no comparative advantage; no comparative advantage and no specialization as depicted in Figure 10.

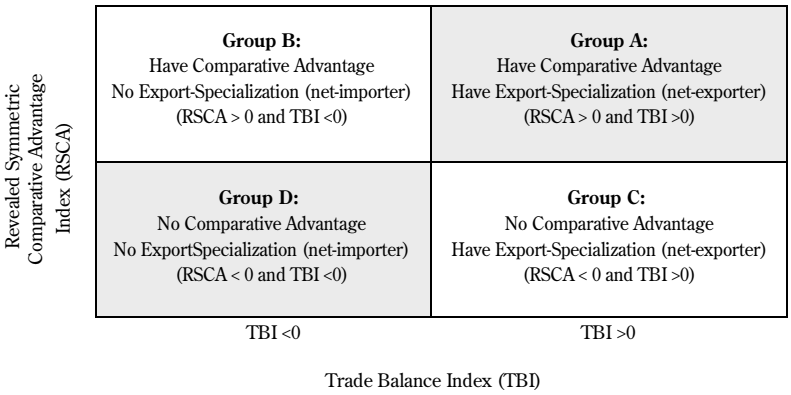
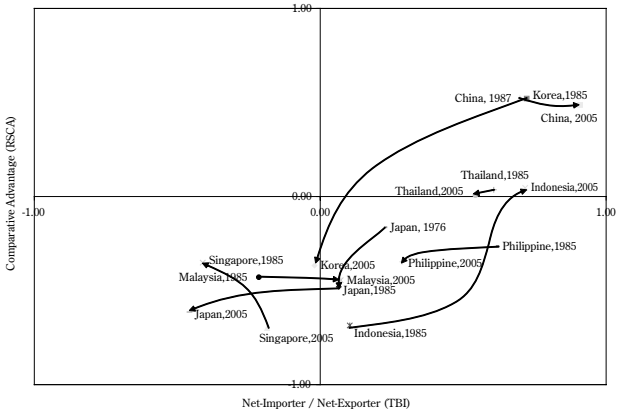


Figure 10. Products Mapping

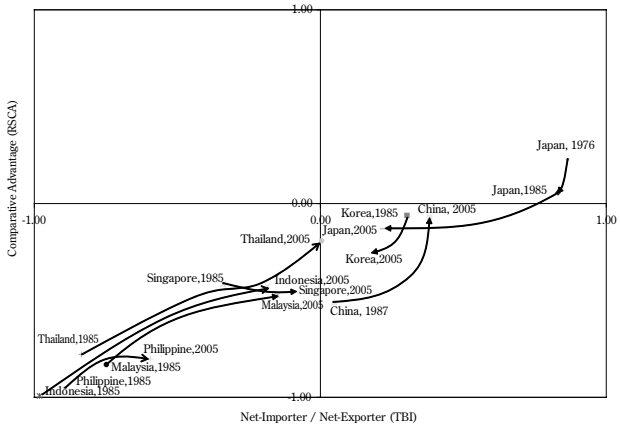
By using the "products mapping" this chapter describes the existence of FG formation in the pattern of comparative advantage. The products of the FG pattern in the past, current and future are also presented. In Figures 11, panels (a), (b) and (c) show the results of "products mapping" for the East Asian countries by the industries. These figures are obtained by following the three stages below. *Firstly,* the RSCA and TBI indexes for each SITC are calculated. *Secondly,* the median of RSCA and TBI indexes for each industry classification are calculated. *Thirdly,* for each industries classification, the median RSCA and TBI indexes are plotted into the "products mapping" (in Figure 10) for two year observations i.e. 1985 and 2005. From Figures 11 it might be argued that *unskilled labor*-intensive industries are in the first round, human *capital*-intensive industries are in the second round and *technology*-intensive industries are in the third round of the FG pattern in the East Asian region.

Most *unskilled labor*-intensive industries and several *human capital*-intensive industries have been transferred from Japan as the lead goose to the other East Asian countries as the follower geese. Figure 12, 13 and 14 show that the industries (SITC) might be potentially transferred in the future.

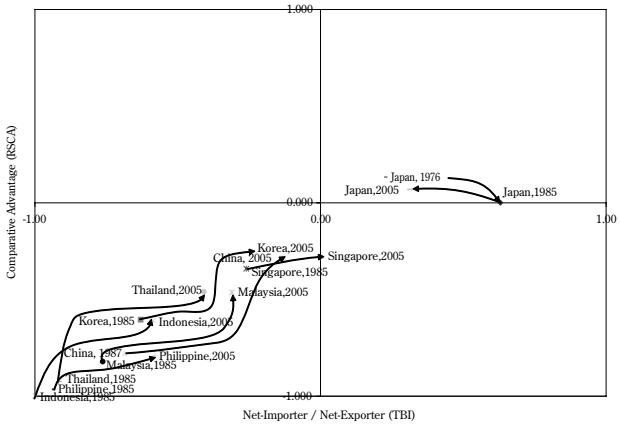
(a) *Unskilled labor*-intensive industries



(b) *Human capital*-intensive industries

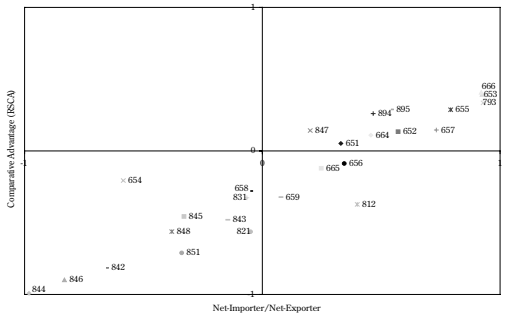


(c) *Technology*-intensive industries

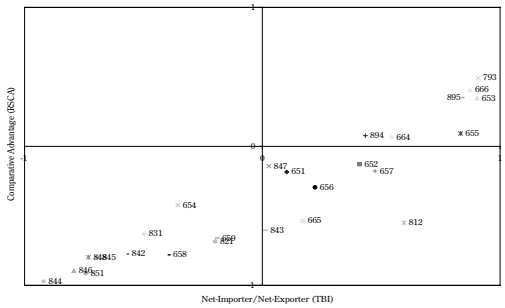


Source: UN-COMTRADE, author's calculation.

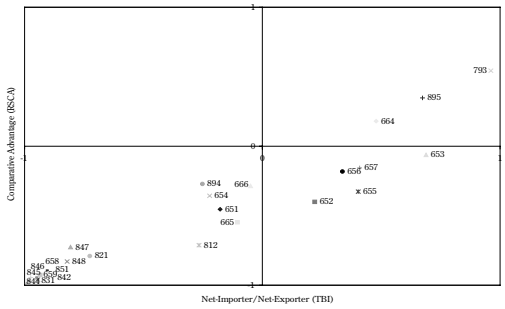
Figure 11. The East Asia FG Pattern



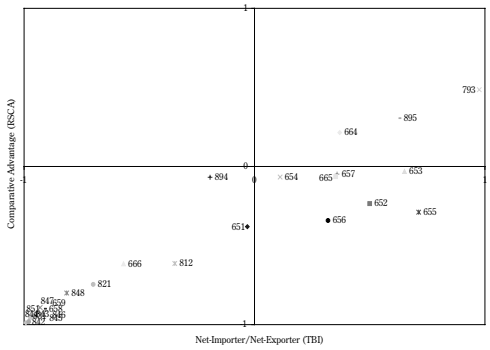
(a) 1976



(a) 1985



(b) 1995



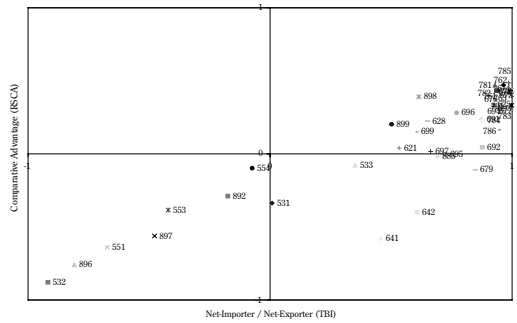
(d) 2005

Notes:

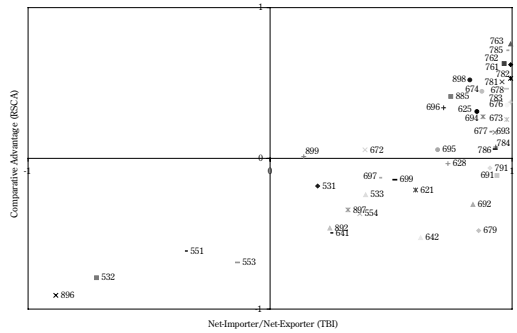
SITC	Commodity Description
651	Textile yarn
652	Cotton fabrics, woven (not including narrow or special fabrics)
653	Fabrics, woven, of man-made fibres (not narrow or special fabrics)
654	Textile fabrics, woven, other than cotton or man-made fibres
655	Knitted or crocheted fabrics (including tubular, etc, fabrics)
656	Tulle, lace, embroidery, ribbons, trimmings and other small wares
657	Special textile fabrics and related products
658	Made-up articles, wholly or chiefly of textile materials, nes
659	Floor coverings, etc
664	Glass
665	Glassware
666	Pottery
793	Ships, boats and floating structures
812	Sanitary, plumbing, heating, lighting fixtures and fittings, nes
821	Furniture and parts thereof
831	Travel goods, handbags etc, of leather, plastics, textile, others
842	Men's and boys' outerwear, textile fabrics not knitted or crocheted
843	Womens, girls, infants outerwear, textile, not knitted or crocheted
844	Under garments of textile fabrics, not knitted or crocheted
845	Outerwear knitted or crocheted, not elastic nor rubberized
846	Under-garments, knitted or crocheted
847	Clothing accessories, of textile fabrics, nes
848	Articles of apparel, clothing accessories, non-textile, headgear
851	Footwear
894	Baby carriages, toys, games and sporting goods
895	Office and stationary supplies, nes

Source: UN-COMTRADE, *author's calculation*

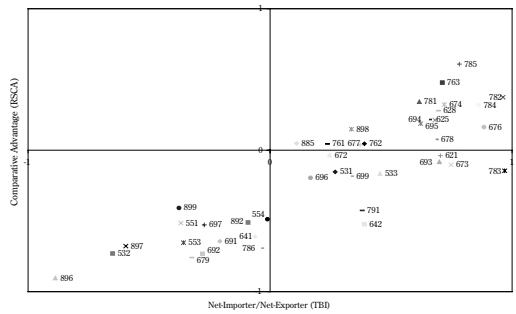
Figure 12. The "Products Mapping" of Japan's Unskilled Labor-Intensive Industries: 1976, 1985, 1995 and 2005



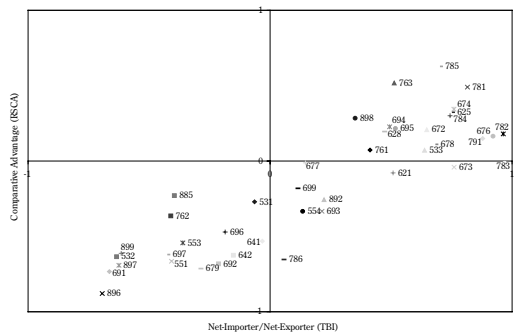
(a) 1976



(b) 1985



(c) 1995



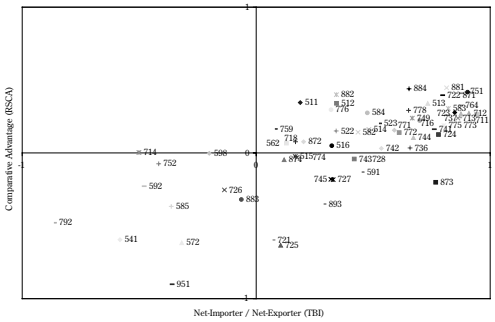
(d) 2005

Notes:

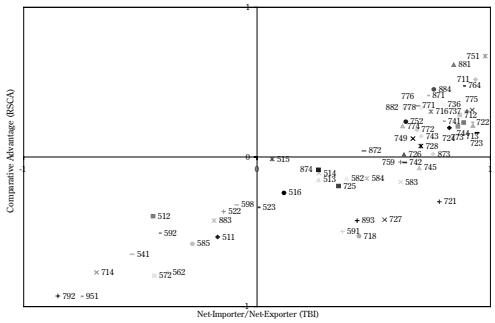
SITC	Commodity Description
531	Synthetic dye, natural indigo, lakes
532	Dyeing and tanning extracts, and synthetic tanning materials
533	Pigments, paints, varnishes and related materials
551	Essential oils, perfume and flavour materials
553	Perfumery, cosmetics, toilet preparations, etc
554	Soap, cleansing and polishing preparations
621	Materials of rubber
625	Rubber tires, tire cases, inner and flaps, for wheels of all kinds
628	Articles of rubber, nes
641	Paper and paperboard
642	Paper and paperboard, precut, and articles of paper or paperboard
672	Ingots and other primary forms, of iron or steel
673	Iron and steel bars, rods, shapes and sections
674	Universals, plates, and sheets, of iron or steel
676	Rails and railway track construction materials, of iron or steel
677	Iron or steel wire (excluding wire rod), not insulated
678	Tube, pipes and fittings, of iron or steel
679	Iron, steel casting, forging and stamping, in the rough state, nes
691	Structures and parts, nes, of iron, steel or aluminium
692	Metal containers for storage and transport
693	Wire products (excluding insulated electrical wire); fencing grills
694	Nails, screws, nuts, bolts, rivets, etc, of iron, steel or copper
695	Tools for use in the hand or in machines
696	Cutlery
697	Household equipment of base metal, nes
699	Manufactures of base metal, nes
761	Television receivers
762	Radio-broadcast receivers
763	Gramophones, dictating machines and other sound recorders
781	Passenger motor vehicles (excluding buses)
782	Lorries and special purposes motor vehicles
783	Road motor vehicles, nes
784	Motor vehicle parts and accessories, nes
785	Cycles, scooters, motorized or not; invalid carriages
786	Trailers, and other vehicles, not motorized, nes
791	Railway vehicles and associated equipment
885	Watches and clocks
892	Printed matter
896	Works of art, collectors' pieces and antiques
897	Gold, silver ware, jewelry and articles of precious materials, nes
898	Musical instruments, parts and accessories thereof
899	Other miscellaneous manufactured articles, nes

Source: UN-COMTRADE, *author's calculation*

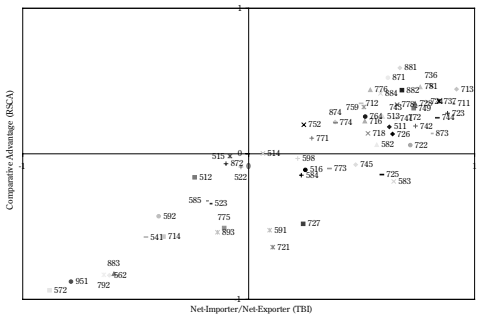
Figure 13. The "products mapping" of Japan's human capital-intensive industries: 1976, 1985, 1995 and 2005



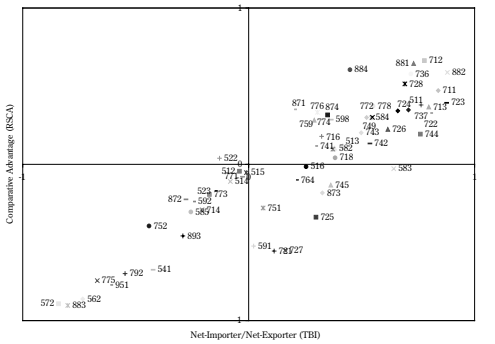
(a) 1976



(b) 1985



(c) 1995



(d) 2005

Notes;
SITC Commodity Description
511 Hydrocarbons, nes, and derivatives
512 Alcohols, phenols etc, and their derivatives
513 Carboxylic acids, and their derivatives
514 Nitrogen-function compounds
515 Organo-inorganic and heterocyclic compounds
516 Other organic chemicals
522 Inorganic chemical elements, oxides and halogen salts
523 Other inorganic chemicals; compounds of precious metals
541 Medicinal and pharmaceutical products
562 Fertilizers, manufactured
572 Explosives and pyrotechnic products
582 Condensation, polycondensation and polyaddition products
583 Polymerization and copolymerization products
584 Regenerated cellulose; derivatives of cellulose; vulcanized fibre
585 Other artificial resins and plastic materials
591 Pesticides, disinfectants
592 Starches, insulin and wheat gluten; albuminoidal substances; glues
598 Miscellaneous chemical products, nes
711 Steam boilers and auxiliary plant; and parts thereof, nes
712 Steam engines, turbines
713 Internal combustion piston engines, and parts thereof, nes
714 Engines and motors, non-electric; parts, nes; group 714, item 71888
716 Rotating electric plant and parts thereof, nes
718 Other power generating machinery and parts thereof, nes
721 Agricultural machinery (excluding tractors) and parts thereof, nes
722 Tractors (other than those falling in heading 74411 and 7832)
723 Civil engineering, contractors' plant and equipment and parts, nes
724 Textile and leather machinery, and parts thereof, nes
725 Paper and paper manufacture machinery, and parts thereof, nes
726 Printing, bookbinding machinery, and parts thereof, nes
727 Food-processing machines (non-domestic) and parts thereof, nes
728 Other machinery, equipment, for specialized industries; parts nes
736 Metalworking machine-tools, parts and accessories thereof, nes
737 Metalworking machinery (other than machine-tools), and parts, nes
741 Heating and cooling equipment and parts thereof, nes
742 Pumps for liquids; liquid elevators; and parts thereof, nes
743 Pumps, compressors; centrifuges; filtering apparatus; etc, parts
744 Mechanical handling equipment, and parts thereof, nes
745 Other non-electric machinery, tools and mechanical apparatus, nes
749 Non-electric parts and accessories of machinery, nes
751 Office machines
752 Automatic data processing machines and units thereof
759 Parts, nes of and accessories for machines of headings 751 or 752
764 Telecommunication equipment, nes; parts and accessories, nes
771 Electric power machinery, and parts thereof, nes
772 Electrical apparatus for making and breaking electrical circuits
773 Equipment for distribution of electricity
774 Electro-medical and radiological equipment
775 Household type equipment, nes
776 Thermionic, microcircuits, transistors, valves, etc
778 Electrical machinery and apparatus, nes
792 Aircraft and associated equipment, and parts thereof, nes
871 Optical instruments and apparatus
872 Medical instruments and appliances, nes
873 Meters and counters, nes
874 Measuring, checking, analysis, controlling instruments, nes, parts
881 Photographic apparatus and equipment, nes
882 Photographic and cinematographic supplies
883 Cinematograph film, exposed and developed
884 Optical goods nes
893 Articles, nes of plastic materials
951 Armoured fighting vehicles, war firearms, ammunition, parts, nes

Source: UN-COMTRADE, *author's calculation*

Figure 14. The "products mapping" of Japan's technology-intensive industries: 1976, 1985, 1995 and 2005

Chapter 8 Export Performance: Constant Market Shares Analysis

Chapter 8 describes the analysis of the East Asian countries' dynamic export market. Constant Market Shares (CMS) method is applied. The CMS method by Leamer and Stern (1970) is formulated as follows:

$$\begin{aligned} V_{ij}^{At} - V_{ij}^{A0} &\equiv \sum_i \sum_j r_{ij} V_{ij}^{A0} + \sum_i \sum_j (V_{ij}^{At} - V_{ij}^{A0} - r_{ij} V_{ij}^{A0}) \\ &\equiv r_{ij} V_{ij}^{A0} + \sum_i (r_i - r) V_{ij}^{A0} + \sum_i \sum_j (r_{ij} - r_i) V_{ij}^{A0} + \sum_i \sum_j (V_{ij}^{At} - V_{ij}^{A0} - r_{ij} V_{ij}^{A0}) \end{aligned} \quad (11)$$

(a) (b) (c) (d)

where V_{ij}^{A0} and V_{ij}^{At} are the values of country A's exports of commodity i in the periods 0 and t, respectively; V_{ij}^{A0} and V_{ij}^{At} represent values of country A's exports to country j in period 0 and t, respectively; V_{ij}^{A0} and V_{ij}^{At} are the values of country A's exports of commodity i to country j in period 0 and t, respectively; r is the percentage increase in total world exports; r_i is the percentage increase in world exports of commodity i; r_{ij} denotes percentage increase in world exports of commodity i to country j. Considering Tyszynski (1951), Richardson (1971a, 1971b) and Fagerberg and Sollie (1987) works, this chapter derives a new version of the CMS method of Leamer and Stern (1970). The new version is formulated as follows:

$$\begin{aligned} \Delta V_{ij}^{A} = {} & S_t^A \Delta V_{ij}^{W} + V_{ij}^{W0} \sum_j (\alpha_t^{Aj} - \alpha_0^{Aj}) \beta_0^{Wj} \delta_0^{Wj} \\ & \text{(a)} \qquad\qquad \text{(b)} \\ & + V_{ij}^{W0} \sum_j \alpha_0^{Aj} (\beta_t^{Wj} - \beta_0^{Wj}) \delta_0^{Wj} + V_{ij}^{W0} s_0^A (\delta_t - \delta_0) \\ & \qquad\qquad \text{(c)} \qquad\qquad \text{(d)} \\ & + V_{ij}^{W0} \sum_j (\alpha_t^{Wj} - \alpha_0^{Wj}) (\beta_t^{Wj} - \beta_0^{Wj}) \delta_0^{Wj} + V_{ij}^{W0} (s_t^A - s_0^A) (\delta_t^A - \delta_0^A) \\ & \qquad\qquad \text{(e)} \qquad\qquad\qquad\qquad \text{(f)} \end{aligned} \quad (12)$$

Equation (12) implies that the change in country A's exports can be caused by (a) the general changes in the world's export, (b) the market share effect, (c) the commodity composition effect, (d) the market composition effect, (e) the commodity adaptation effect, (f) the market adaptation effect. There are some main differences between the *new* version (12) by the author and the original version by Leamer and Stern (1970). *First,* the problem of subjectivity in the choice of which effects coming first − i.e. the market distribution effect or the commodity composition effect in the CMS version by Leamer and Stern (1970) − is avoided in this *new* version. *Second,* the *new* version gives six effects instead of Leamer and Stern's four effects. In the *new* version the market adaptation and commodity adaptation effects are introduced instead of Leamer and Stern's residual effect. Clear economic interpretation of the two effects is also given. *Third,* Laspeyres index were employed throughout the calculations. Therefore, lack of comparability due to differences in weighting procedures is avoided (Fagerberg and Sollie, 1987).

The *new* version of the CMS is then employed to analyze the exports performance of some regions and the East Asian countries. This chapter uses data on exports based on 3-digit SITC Revision 2. This chapter applies the definitions of products by the Empirical Trade Analysis (ETA): (a) *primary* products (83 SITC), (b) *natural resource*-intensive products (21 SITC), (c) *unskilled labor*-intensive products (26 SITC), (d) *technology*-intensive products (62 SITC), (e) *human capital*-

intensive products (43 SITC), (f) *others* (5 SITC).

This research defines the export destinations consisting of the ASEAN5 (Singapore, Indonesia, Malaysia, Thailand and the Philippines), the North East Asia (Japan, Mainland-China, Hong Kong-China and Korea), the European Union (the EU: all 27 countries) and the North America Free Trade Area (the NAFTA: the US, Canada and Mexico), and the rest of the world (Rest). Table 6 shows the CMS analysis for some regions i.e. the EU, the NAFTA, the North East Asia, the ASEAN5 and rest of the world. Table 7 shows the CMS analysis for the North East Asian countries (Japan, Korea, Hong Kong and China) and the US.

Table 6. The CMS Analysis: Some Regions

Regions	Change in Export ($ US)	Due to (%)					
		General rise in world exports	Market share	Commodity composition	Market composition	Commodity adaptation	Market adaptation
EU							
1980-1985	-42,312,516,458	-12.5	-66.5	-20.4	213.0	21.0	-34.5
1985-1990	565,284,106,231	92.1	4.1	3.1	1.3	-0.3	-0.3
1990-1995	985,560,243,598	57.2	41.4	0.7	-7.5	1.5	6.7
1995-2001	255,376,839,742	193.9	-73.6	-5.0	-19.8	-0.5	4.9
2001-2006	2,132,901,664,724	95.4	2.3	-0.5	3.0	0.0	-0.2
NAFTA							
1980-1985	229,064,546,136	0.3	69.6	-1.5	-6.0	2.4	35.3
1985-1990	252,110,703,572	113.8	-0.5	-3.9	-7.7	-0.8	-1.0
1990-1995	307,513,205,593	91.0	12.8	3.0	5.7	-4.6	-8.0
1995-2001	296,865,124,180	68.3	0.9	4.6	24.3	-0.9	2.8
2001-2006	524,521,576,640	190.7	-66.2	3.7	-28.2	-0.1	0.1
North East Asia							
1980-1985	83,950,312,412	1.8	31.8	12.7	-18.0	4.3	67.4
1985-1990	245,965,384,960	100.0	-11.2	10.8	-5.0	0.8	4.6
1990-1995	394,419,248,361	64.7	20.5	5.2	11.0	-0.1	-1.3
1995-2001	120,698,001,433	175.7	-51.0	-15.0	-2.7	-1.0	-5.9
2001-2006	1,250,523,763,181	70.4	32.9	-4.4	1.6	-0.9	0.3
ASEAN5							
1980-1985	2,298,828,307	26.6	381.0	-289.9	-281.0	-217.7	480.9
1985-1990	70,278,175,887	95.5	4.7	-16.5	16.7	7.1	-7.5
1990-1995	172,246,567,596	41.4	46.6	-4.1	15.1	3.4	-2.4
1995-2001	51,798,578,630	142.8	-14.8	7.0	-25.8	4.4	-13.7
2001-2006	348,114,593,172	90.7	7.0	-0.9	2.6	0.4	0.1
Rest of the world							
1980-1985	-69,534,603,370	-17.9	-165.5	97.5	317.8	2.1	-134.0
1985-1990	1,296,565,534,480	96.3	8.4	-1.7	-6.1	0.0	3.0
1990-1995	1,206,765,438,781	109.4	3.2	0.1	-15.4	-0.8	3.5
1995-2001	1,001,811,398,856	89.7	5.5	2.9	0.3	0.4	1.3
2001-2006	3,832,094,025,864	108.5	-10.1	1.0	0.5	0.6	-0.5

Source: UN-COMTRADE, *author's calculation.*

Table 7. The CMS Analysis: the US and the North East Asian Countries

Countries	Change in Export ($ US)	Due to (%)					
		General rise in world exports	Market share	Commodity composition	Market composition	Commodity adaptation	Market adaptation
the US							
1980-1985							
1985-1990	186,345,160,224	108.1	-5.8	1.1	-0.9	-0.8	-1.6
1990-1995	190,098,861,680	105.9	-6.7	10.9	6.9	-5.6	-11.5
1995-2001	148,041,156,897	93.6	-11.3	8.5	10.7	-1.8	0.3
2001-2006	306,023,386,745	207.6	-95.8	1.8	-9.5	-1.8	-2.3
Japan							
1980-1985	46,094,286,739	2.6	3.9	14.9	-25.1	2.7	101.0
1985-1990	111,046,176,355	154.5	-60.8	16.3	-8.6	-3.5	2.1
1990-1995	155,989,910,885	94.3	-13.2	10.9	9.1	-0.7	-0.4
1995-2001	-39,573,750,448	-265.9	343.4	9.1	-2.3	8.6	7.1
2001-2006	243,361,449,419	144.1	-43.7	0.6	-5.1	0.6	3.6
Korea							
1980-1985	12,176,616,353	1.4	32.1	14.2	-12.5	0.3	64.5
1985-1990	34,732,846,170	85.1	2.6	16.1	-3.3	-2.9	2.4
1990-1995	60,040,778,560	55.5	37.2	2.9	10.7	-0.2	-6.2
1995-2001	25,378,033,898	117.1	6.3	-14.0	-8.3	1.8	-2.9
2001-2006	175,022,762,746	74.7	21.1	-3.7	3.4	2.4	2.0
Hong Kong							
1980-1985	10,353,759,326	1.8	12.5	18.9	-19.0	8.4	77.4
1985-1990	52,332,449,709	56.0	28.8	12.8	3.8	-0.4	-1.1
1990-1995	91,480,453,948	46.2	36.5	4.2	10.5	0.5	2.1
1995-2001	17,195,377,021	240.2	-122.0	-21.3	2.0	14.4	-13.2
2001-2006	131,602,652,422	126.2	-28.8	-12.1	8.2	5.0	1.5
China							
1980-1985	15,032,307,052						
1985-1990	47,059,084,449						
1990-1995	86,584,288,820	36.8	53.7	-2.6	14.9	0.4	-3.2
1995-2001	117,422,528,269	30.1	80.0	-6.1	-2.2	-0.7	-1.1
2001-2006	702,837,392,423	32.9	74.5	-4.7	2.2	-3.4	-1.5

Source: 3-digit SITC Revision 2, UN-COMTRADE. *Author's calculation*

Table 8. The CMS Analysis: ASEAN5

Countries	Change in Export ($ US)	Due to (%)					
		General rise in world exports	Market share	Commodity composition	Market composition	Commodity adaptation	Market adaptation
Singapore							
1980-1985	3,470,348,201	5.1	146.0	-8.7	-75.3	-53.1	86.0
1985-1990	29,870,082,224	74.6	21.7	-2.2	8.5	1.0	-3.6
1990-1995	65,547,210,386	41.2	40.2	1.4	11.6	6.0	-0.3
1995-2001	3,490,635,025	804.9	-554.9	114.0	-187.6	-12.3	-64.1
2001-2006	150,047,157,087	70.5	25.3	0.8	2.6	0.1	0.7
Indonesia							
1980-1985	-3,322,178,480	-6.1	38.0	128.5	38.8	26.0	-125.2
1985-1990	7,088,612,816	255.8	-144.2	-76.7	53.9	35.1	-23.9
1990-1995	19,742,639,595	66.7	40.6	-26.0	31.0	1.7	-14.0
1995-2001	10,898,869,340	99.0	41.2	-10.1	-17.3	-0.8	-11.9
2001-2006	44,481,783,995	110.0	-14.4	-4.7	9.0	1.5	-1.4
Malaysia							
1980-1985	2,693,190,560	4.4	228.5	-52.7	-50.3	-82.0	52.2
1985-1990	13,815,331,786	110.4	-9.9	-30.6	30.4	12.8	-13.1
1990-1995	44,324,940,200	34.1	51.7	-5.5	18.8	4.0	-3.1
1995-2001	14,226,337,763	123.2	0.6	9.0	-23.8	4.5	-13.5
2001-2006	72,664,743,931	105.3	-2.3	-1.3	0.6	-0.1	-2.2
Thailand							
1980-1985	616,301,097	9.7	154.6	-63.8	-134.7	-40.5	174.7
1985-1990	15,947,077,204	43.6	58.7	-7.2	5.3	1.7	-2.1
1990-1995	33,370,621,437	35.4	61.4	-3.5	8.4	-1.5	-0.2
1995-2001	8,479,712,660	158.1	-33.5	2.6	-25.1	2.3	-4.4
2001-2006	65,660,993,411	85.9	10.6	-0.3	2.1	0.4	1.2
the Philippines							
1980-1985	-1,158,833,071	-4.6	185.7	24.2	31.9	-13.8	-123.4
1985-1990	3,557,071,857	127.0	-26.0	-3.7	9.6	3.4	-10.2
1990-1995	9,261,155,978	45.3	27.6	8.5	12.2	3.2	3.2
1995-2001	14,703,023,842	28.2	67.7	-4.9	4.1	13.4	-8.6
2001-2006	15,259,914,748	183.1	-81.0	-7.3	-4.2	3.4	5.9

Source: 3-digit SITC Revision 2, UN-COMTRADE. *author's calculation*

Table 8 shows the CMS analysis for the individual ASEAN5 countries namely Singapore, Indonesia, Malaysia, Thailand and the Philippines.

Some conclusions are obtained. *First,* the constant share norm seems powerful in explaining a country's exports performance since the mid 1980s. *Second,* the proliferation of regionalism and economic integrations in the beginning of 1990-s caused the change in trade pattern. Intra-regional trade has increased significantly. However, this chapter finds that the change in trade pattern only happened in short term (in the beginning of economic integration) i.e. 1990-1995 in the case of the EU, the North East Asia and the ASEAN5 and 1995-2001 in the case of the NAFTA.

Chapter 9 Intra-Regional and Intra-Industry Trade

Chapter 9 analyzes the phenomenon of intra- and inter-industry trade in both intra- and inter-regional trade in the East Asia. Grubel and Lloyd (1975) formulated inter- and intra-industry trade as follows:

Inter-industry trade: $$IIe_{ijk}=\frac{|X_{ijk}-M_{ijk}|}{(X_{ijk}+M_{ijk})}\times 100 \quad (13)$$

Intra-regional trade: $$IIa_{ijk}=\frac{(X_{ijk}+M_{ijk})-|X_{ijk}-M_{ijk}|}{(X_{ijk}+M_{ijk})}\times 100 = \left(1-\frac{|X_{ijk}-M_{ijk}|}{(X_{ijk}+M_{ijk})}\right)\times 100 \quad (14)$$

where i, j and k are industry (SITC), country, the exports destination markets or the region source of imports, respectively. X and M are values of exports and imports, respectively. We modify the intra- and inter-industry trade measures originally made by Grubel and Lloyd (1975) to incorporate intra- and inter-regional trade. The modified measures then are applied to scrutinize the phenomena of intra- and inter-industry trade in both intra- and inter-regional trade in the East Asia.

- Inter-industry trade in inter-regional trade:

$$IIe_{ijl}=\frac{\left|X_{ijl}-\frac{M_{ijl}}{\alpha_{ikl}}\right|}{\left(X_{ijl}-\frac{M_{ijl}}{\alpha_{ikl}}\right)}\times 100 \quad (15)$$

- Inter-industry trade in intra-regional trade:

$$IIe_{ijk}=\frac{\left|X_{ijk}-\frac{M_{ijk}}{\alpha_{ikk}}\right|}{\left(X_{ijl}-\frac{M_{ijk}}{\alpha_{ikk}}\right)}\times 100 \quad (16)$$

- Intra-industry trade in inter-regional trade:

$$IIa_{ijl}=\left(1-\frac{\left|X_{ijl}-\frac{M_{ijl}}{\alpha_{ikl}}\right|}{\left(X_{ijl}-\frac{M_{ijl}}{\alpha_{ikl}}\right)}\right)\times 100 \quad (17)$$

- Intra-industry trade in intra-regional trade:

$$IIa_{ijk}=\left(1-\frac{\left|X_{ijk}-\frac{M_{ijk}}{\alpha_{ikk}}\right|}{\left(X_{ijl}-\frac{M_{ijk}}{\alpha_{ikk}}\right)}\right)\times 100 \quad (18)$$

where α_{ikl} is the region's k adjustment coefficient industry i for region l i.e. $\alpha_{ikl}=\frac{X_{ikl}}{M_{ikl}}$.

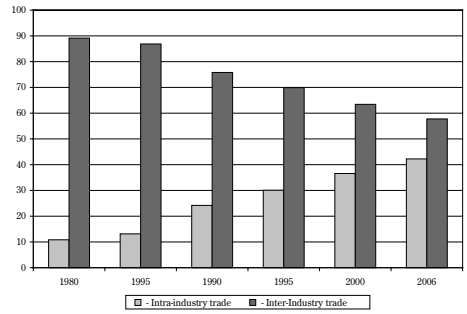
This is due to exports FOB (free on board) and imports CIF (cost, insurance and freight). Figure 15 shows trends of intra-industry trade and inter-industry trade in both intra-regional trade (left hand side) and inter-regional trade (right hand side) in the East Asian countries.

Some conclusions are obtained in this chapter. *First,* intra-regional trade increased significantly

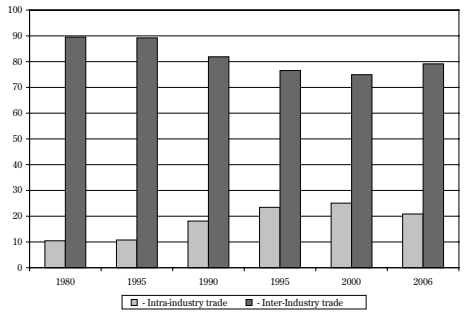
in the case of the East Asia and the NAFTA. *Second*, the more significant intra-industry trade has reduced the dominance of inter-industry trade in the East Asia. *Third*, intra-industry trade in intra-regional trade has higher increase than that in inter-regional trade. It suggests that more trade liberalization among the East Asian countries is required to increase intra-industry trade in intra-regional trade in the region.

Trade by Region

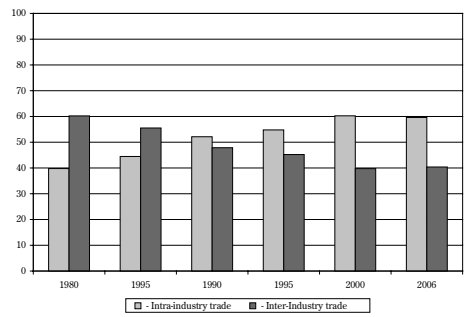
Intra-Regional Trade

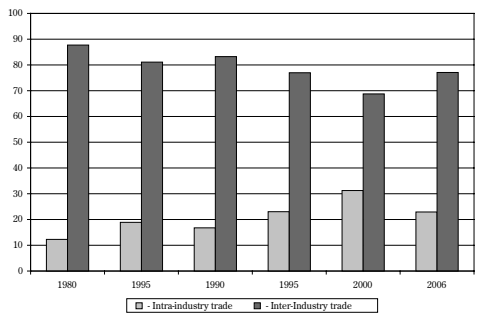


Inter-Regional Trade

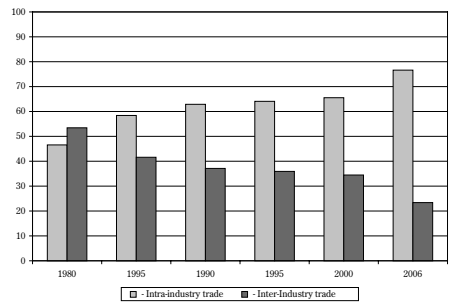


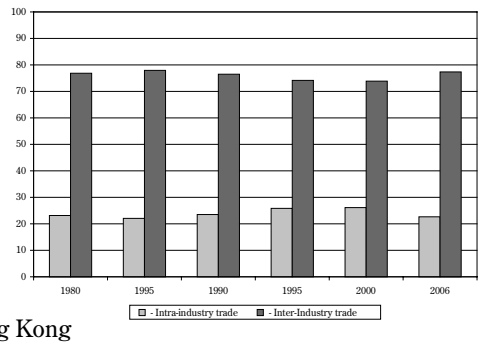
a. Japan



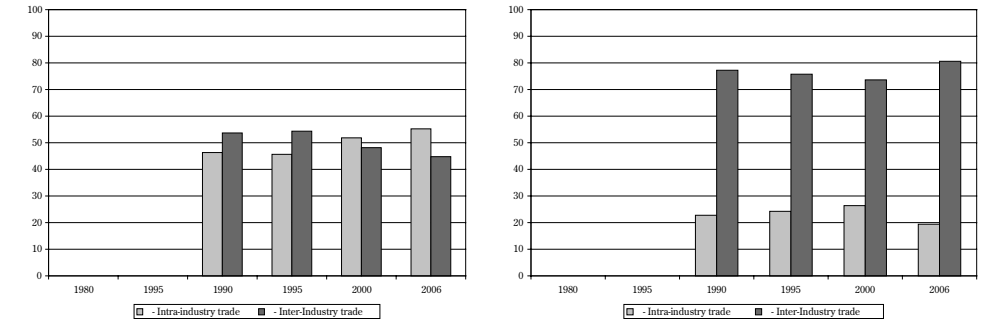


b. Korea

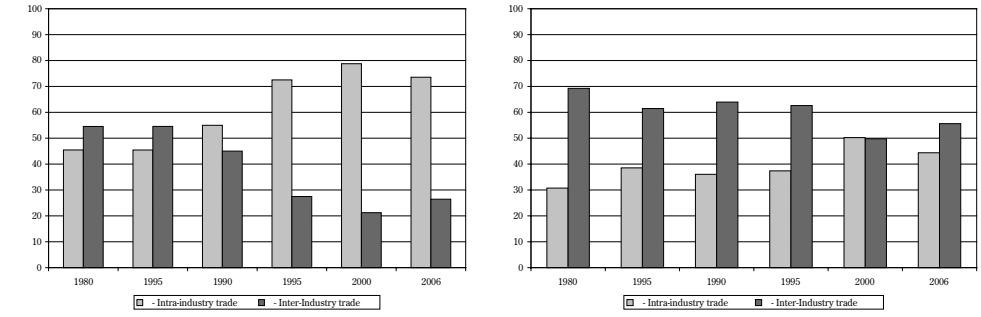




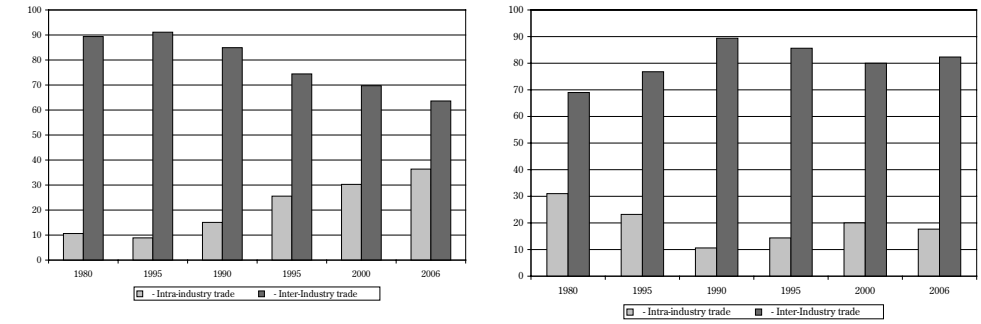
c. Hong Kong



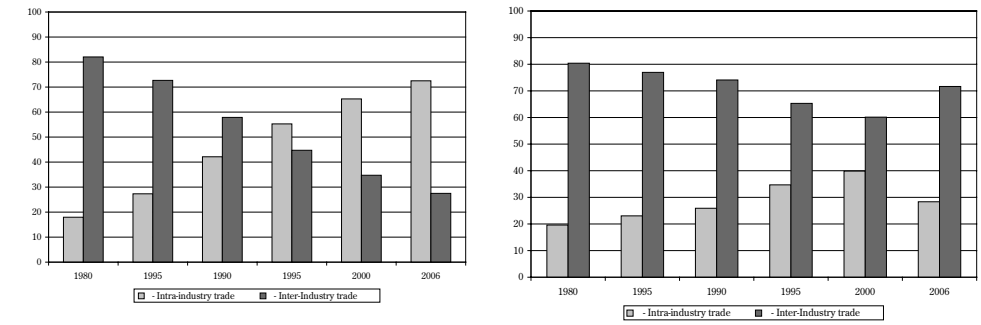
d. China



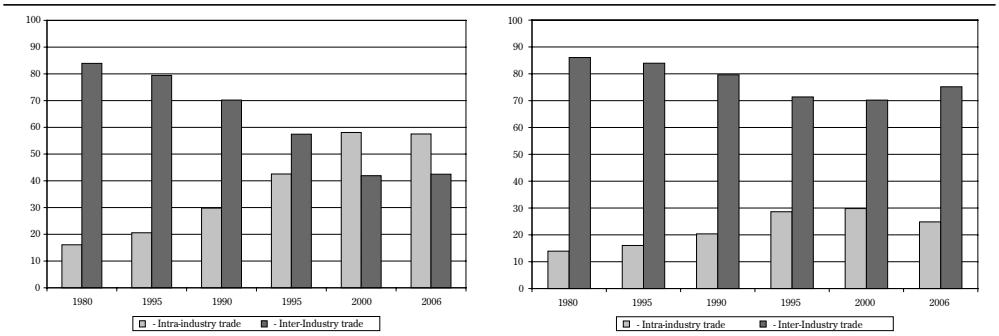
e. Singapore



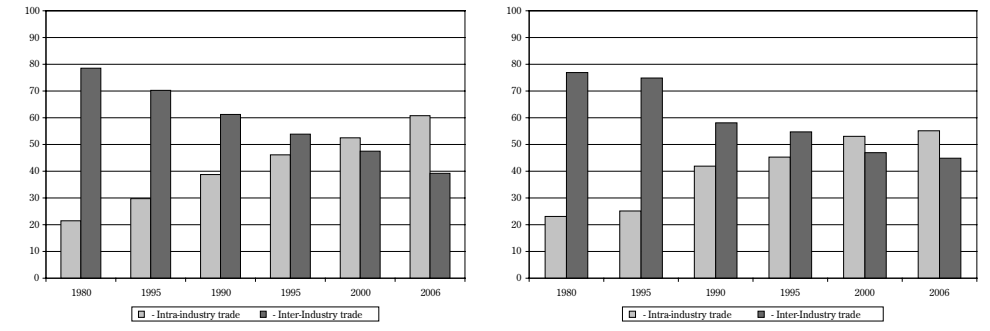
f. Indonesia



g. Malaysia



h. Thailand



i. Philippines

Source: UN-COMTRADE, *author's calculation*

Figure 15. Intra-industry and Inter-industry Trade: East Asian Countries

Chapter 10 Purchasing Power Parity Adjusted Non-Traded Goods

Chapter 10 analyzes the Purchasing Power Parity (PPP) hypothesis in the cases of East Asian countries. One of the important determinants is productivity differentials that alter equilibrium relative prices between tradable and non-tradable goods. It is commonly called the "productivity-bias hypothesis" or the Balassa-Samuelson effect after two seminal papers, which have placed the foundation for the structural models of inflation, were published by Balassa (1964) and Samuelson (1964). The East Asian countries, which have different exchange rate regimes, level of economic development and trade barriers are interesting subjects for research on PPP. Does PPP not hold in the strong sense in the case of East Asian countries? Do relative prices of non-traded goods and the terms of trade play an important role in causing deviations away from PPP? This chapter tests the PPP hypothesis adjusted for Balassa-Samuelson effect (hereinafter called bse) as follows:

$$e_t = \beta_1 + \beta_2(\beta_3 p_{N,t} + (1-\beta_3)p_{T,t}) + \beta_4(\beta_3 p^f_{N,t}) + (1-\beta_3)p^f_{T,t})\beta_3 bse_t + u_t \qquad (19)$$

where e_t is the nominal exchange rate; p_N and p_T represent domestic prices of non-trade goods and traded goods, respectively; p^f_N and p^f_T denote foreign prices of non-trade goods and traded goods, respectively; bse$=(p_N - p_T) - (p^f_N - p^f_T)$ denotes Balassa-Samuelson effect. All variables are in

logarithm form. This chapter applies univariate (stationary test on real exchange rate, RER); a multivariable econometric model of PPP adjusted Balassa-Samuelson effect and multivariate cointegration to analyze the PPP hypothesis in the cases of East Asian countries.

Table 9 summarizes the results of the Phillips-Perron (PP)-test. Since the PP-test statistic is greater than the critical value of corresponding level of significance used (1 percent, 5 percent and 10 percent), we accept the hypothesis (Ho) of unit roots and conclude that the series are not stationary. For all level of significance, we can conclude that RER is not stationary.

Tables 10 and 11 show the econometric model (19) using Ordinary Least Squares (OLS) and Generalized Autoregressive Conditional Heteroscedasticity (GARCH). Table 12 exhibits a summary of the test for the number of cointegrating vector. Some conclusions are obtained. *First,* the PPP hypothesis does not hold in the strong sense in the case of all selected Asian countries. Japan and Hong Kong have contrary signs for the estimated coefficient. *Second,* the relative non-traded goods prices play significant role in causing deviation away from the PPP hypothesis. *Third,* the Balassa-Samuelson effect does exist in the case of Asian countries, except Japan, Hong Kong and the Philippines.

Table 9. PPP Test Based on Real Exchange Rate (RER)

Country	PP test Statistic	Level of Significance	Critical Value	Conclusion	
				RER stationary or non-stationary	PPP Hold or not Hold
1. Japan	-2.316662	1%	-4.0241	Non-stationary	Not Hold
		5%	-3.4415	Non-stationary	Not Hold
		10%	-3.1451	Non-stationary	Not Hold
2. Korea	-1.905949	1%	-3.4767	Non-stationary	Not Hold
		5%	-2.8815	Non-stationary	Not Hold
		10%	-2.5773	Non-stationary	Not Hold
3. Hong Kong	1.766085	1%	-3.5625	Non-stationary	Not Hold
		5%	-2.9190	Non-stationary	Not Hold
		10%	-2.5970	Non-stationary	Not Hold
4. China	-1.481158	1%	-3.6228	Non-stationary	Not Hold
		5%	-2.9446	Non-stationary	Not Hold
		10%	-2.6105	Non-stationary	Not Hold
5. Singapore	-2.337505	1%	-4.0320	Non-stationary	Not Hold
		5%	-3.4452	Non-stationary	Not Hold
		10%	-3.1473	Non-stationary	Not Hold
6. Indonesia	-2.088084	1%	-3.4779	Non-stationary	Not Hold
		5%	-2.8821	Non-stationary	Not Hold
		10%	-2.5776	Non-stationary	Not Hold
7. Malaysia	-0.440427	1%	-4.0648	Non-stationary	Not Hold
		5%	-3.4608	Non-stationary	Not Hold
		10%	-3.1564	Non-stationary	Not Hold
8. Thailand	-1.445808	1%	-3.4767	Non-stationary	Not Hold
		5%	-2.8815	Non-stationary	Not Hold
		10%	-2.5773	Non-stationary	Not Hold
9. Philippines	-0.174259	1%	-4.1584	Non-stationary	Not Hold
		5%	-3.5045	Non-stationary	Not Hold
		10%	-3.1816	Non-stationary	Not Hold

Source: International Monetary Fund, International Financial Statistic （IFS-IMF）, *author's calculation.*

Table 10. Estimation Result and Tests: Least Squares (LS)

	Japan	Korea	Hong Kong	China	Singapore	Indonesia	Malaysia	Thailand	Philippine
A. Estimation									
Constant (β_1)	4.612866**	6.896222**	2.295216**	4.756599	1.701035**	10.87004**	2.130584**	3.509414**	9.439379**
Coefficient of Domestic Prices (β_2)	-0.991813**	1.091581**	-0.061204**	0.276422**	0.243865**	0.917723**	1.633930**	1.164261**	1.768024**
Coefficient of BSE (β_3)	-433.6979	0.321637*	0.000733	0.171144**	-0.398875**	-0.675738**	-0.259818	-0.344140*	0.088880
Coefficient of Foreign Prices (β_4)	0.999924**	-1.089646**	0.007767	-0.947789	-0.500321**	-1.327416**	-1.823919**	-1.158134**	-3.015229**
R-squared	0.881278	0.901270	0.446698	0.770358	0.843926	0.986907	0.753459	0.821679	0.956374
B. PPP and BSE tests:									
Proportionality and symmetry Ho:$\beta_2=1$, $\beta_3=0$, $\beta_4=-1$ (F-statistics)	15912422*	14.65994**	36061.68**	231.0972**	195.3804**	142.9731**	34.04307**	29.68989**	20.13348**
Conclusion	PPP does not hold	PPP does not hold	PPP does not hold	PPP does not hold	PPP does not hold	PPP does not hold	PPP does not hold	PPP does not hold	PPP does not hold
Balassa-Samuelson effect Ho: $\beta_3=0$ (z-statistics)	0.004113	6.611689*	0.006316	69.37227**	18.19620**	94.74031**	2.728694	4.197531*	1.086955
Conclusion	BSE does not exist	BSE exists	BSE does not exist	BSE exists	BSE exists	BSE exists	BSE does not exist	BSE exists	BSE does not exist
C. Classical assumption tests:									
- Autocorrelation[3] LM test (F-statistic)	233.1635**	1105.146**	51.44209**	9.396010**	305.5572**	172.4317**	150.1523**	811.1989**	25.43390**
Conclusion	Autocorrelation	Autocorrelation	Autocorrelation	Autocorrelation	Autocorrelation	Autocorrelation	Autocorrelation	Autocorrelation	Autocorrelation
- Heteroscedasticity[4] White Heteroscedasticity (F-statistic)	5.951518**	7.954037**	10.35660**	6.469656**	8.666113**	13.26724**	13.94169**	4.221749**	1.836909
Conclusion	Heteroscedasticity	Heteroscedasticity	Heteroscedasticity	Heteroscedasticity	Heteroscedasticity	Heteroscedasticity	Heteroscedasticity	Heteroscedasticity	No Heteroscedasticity
- ARCH LM test F-statistic	233.1635**	562.8050**	29.43318**	31.84248**	248.3391**	155.8938**	116.4187**	381.7797**	11.81002**
Conclusion	ARCH effect	ARCH effect	ARCH effect	ARCH effect	ARCH effect	ARCH effect	ARCH effect	ARCH effect	ARCH effect

Note:* (**) denotes rejection of the hypothesis at the 5% (1%) level
Source: IFS-IMF, *author's calculation.*

Table 11. Estimation Results: ARCH and GARCH[1]

	Japan	Korea	Hong Kong	China	Singapore	Indonesia	Malaysia	Thailand	Philippine
A. Estimation									
Constant (β_1)	4.586916**	7.545136**	2.298815**	2.903789	2.055269**	11.33702**	1.826409**	3.774185**	10.37400**
Coefficient of Domestic Prices (β_2)	-0.988994**	1.235045**	-0.066142*	0.289693**	0.144562**	0.941231**	1.597417**	1.111896**	1.719131**
Coefficient of BSE (β_3)	-327.5470	0.338779***	0.009231**	0.163341**	-0.456586**	-0.619072**	-0.230753	-0.753735**	0.040890
Coefficient of Foreign Prices (β_4)	1.000115**	-1.372841**	0.011792**	-0.545573	-0.468048**	-1.456538**	-1.721524**	-1.160216**	-3.173558**
R-squared	0.864664	0.890716	0.385081	0.752856	0.802600	0.981800	0.771129	0.796995	0.925373
B. PPP and BSE tests:									
Proportionality and symmetry Ho:$\beta_2=1$, $\beta_3=0$, $\beta_4=-1$ (F-statistics)	24477739**	71.93126**	17304891**	935.6101**	1536.558**	444.8464**	93.60865**	270.5490**	861.6984**
Conclusion	PPP does not hold	PPP does not hold	PPP does not hold	PPP does not hold	PPP does not hold	PPP does not hold	PPP does not hold	PPP does not hold	PPP does not hold
Balassa-Samuelson effect Ho: $\beta_3=0$ (z-statistics)	0.013928	47.16661**	3.941037	241.9555**	56.09233**	473.8601**	4.636085*	42.42311**	1.192457
Conclusion	BSE does not exist	BSE exists	BSE does not exist	BSE exists	BSE exists	BSE exists	BSE exists	BSE exists	BSE does not exist
C. Residual test									
ARCH LM test	1.224178	3.598574	1.612845	0.651231	0.538784	2.426381	0.731372	0.113736	0.548166
F-statistic Conclusion	No ARCH effect	No ARCH effect	No ARCH effect	No ARCH effect	No ARCH effect	No ARCH effect	No ARCH effect	No ARCH effect	No ARCH effect
Normal distribution test	6.657844**	9.990397***	44.45103***	5.002873	2.7277399	1.117568	2.034470	3.452714	0.155197
Jarque-Bera statistic Conclusion	Not Normal distribution	Not Normal distribution	Not Normal distribution	Normal distribution	Normal distribution	Normal distribution	Normal distribution	Normal distribution	Normal distribution
Model	GARCH (1,2)	ARCH (1)	GARCH (1,1)	GARCH (1,1)	GARCH (1,1)	ARCH (1)	GARCH (1,1)	GARCH (1,2)	ARCH (1)

Note:* (**) denotes rejection of the hypothesis at the 5% (1%) level
Source: IFS-IMF, *author's calculation.*

Table 12. Johansen Test (Trace Statistics) for Number of Cointegrating Vectors

	Japan	Korea	Hong Kong	China	Singapore	Indonesia	Malaysia	Thailand	Philippine
r=0 (none)	27.7845**	104.3318**	106.1524**	148.6335**	95.81908**	102.8254**	89.92661**	92.37723**	124.6857**
r=1 (at most 1)	68.89705**	54.39773	63.85000*	86.21280**	49.56345	51.95094	55.76370*	44.64629*	80.54729**
r=2 (at most 1)	40.33943*	21.33503	34.56015	47.16040*	26.69840	17.40404	24.70146	20.72133	46.19249*
r=3 (at most 1)	12.36722	7.062148	19.92361	26.04861*	11.38232	6.886515	7.118632	9.654901	27.17620*
r=4 (at most 1)	0.361564	0.477565	8.433609	10.27728	0.000753	0.401800	0.005931	0.144724	11.47110
Cointegration Test Specification	Intercept, Quadratic deterministic trend	Intercept, Quadratic deterministic trend	Intercept, Linear deterministic trend	Intercept, Linear deterministic trend	Intercept, Quadratic deterministic trend	Intercept, Quadratic deterministic trend	Intercept, Quadratic deterministic trend	No intercept, No trend	Intercept, Linear deterministic trend

Chapter 11 Structure of Protection in Manufacturing Sector: Indonesian Case Study

Chapter 11 shows a case study i.e. structure of protection in Indonesian manufacturing sector. This chapter uses the Indonesian Input-Output (IO) tables and data on tariffs to calculate a degree of protection, namely effective rate of protection (ERP) by Balassa (1971). The ERP is formulated as:

$$D_i = \frac{T_i - \sum_j a_{ij} T_j}{1 - \sum_j a_{ij}} \tag{20}$$

where D_i is effective rate of protection in industry i; a_{ij} represent input-output coefficients. T_i and T_j denote the nominal rates of protection for industry i and j, respectively. The calculation results are presented in Table 13.

Effective Rate of Protection (ERP) analysis shows that Indonesian manufacturing sector has

Table 13. ERP Manufacturing Sector in Selected East Asian Countries (in percent)

Country	Year	ERP	Source
Indonesia	1975	74	World Bank (1993) **
	1987	70	Fane and Condon (1996) **
	1990	59	World Bank (1993) **
	1991	51[a], 55.6[b]	This research
	1995	25[c]; 42.4[a,d], 45.6[b,d]	[c]Fane and Condon (1996) **; [d]This research
	2000	25.7	Soesastro and Basri (2005)
	2001	16.5[a], 23.4[b]	This research
	2005	10.2[a], 11.6[b]	This research
South Korea	1970	40	World Bank (1993)
	1975	55	World Bank (1993)
	1980	67	World Bank (1993)
	1985	80	World Bank (1993)
	1988	28	Panagariya (1993)
Malaysia	1969	45	Shalleh and Meyanadan (1993)
	1979/80	31	Shalleh and Meyanadan (1993)
	1988	23	Panagariya (1994)
	2003	16[e]; 10.4[f]	[e]Athukorala (2005a); [f]This research
Philippines	1992	32	Panagariya (1994)
	1999	10	WTO (1999) *
Thailand	1981	74	World Bank (1993)
	1988	51	Panagariya (1994)
	2002	25.2	Athukorala *et al.* (2004)
	2004	22.7	Athukorala *et al.* (2004)
Vietnam	1997	121	Athukorala (2002)
	2002	95	Athukorala (2002)
	2003	44	Athukorala (2005)

Notes:
* Calculated as the weighted average of estimates by industry reported in the given source. Weighting was done by using value added data from UNIDO.
** Estimate for non-oil manufacturing.
[a] the simple average of ERP of industry ISIC (taken from Table 11.3) ; [b] the simple average of ERP industry IO-codes (taken from Table 11.4)
Source: mainly from Athukorala (2005b) and *author's calculation*.

become more liberalized i.e. starting from very high rate of protection during inward-looking regimes to the lower rate of protection after the Asian financial crisis onward. Trade liberalization was intensified at the start of IMF program, with highlight on the elimination of non-tariff measures for agricultural products and measures to protect the national car scheme (called *Timor*). During the crisis, the government committed itself to removing almost all import licenses, including the import licenses that fell outside previous WTO commitments (Vanzetti *et al.,* 2005). Moreover, the liberalization in manufacturing sector has also be encouraged by international/regional commitments under the AFTA, APEC, WTO and PTAs. Compared with the other old ASEAN members, the Indonesian liberalization process in manufacturing sector can catch up with the Malaysian liberalization process, especially after Asian financial crisis. It was much faster than the Thai liberalization process which showed slower progress.

Conclusion

- From the background of establishment and the evolution in organizational structure of the ASEAN, it is argued that the ASEAN has changed its focus from political to economic interests. Parallel with the proliferation of economic regionalism in the world and the period of active trade liberalization in the 1980s and 1990s, the ASEAN has pushed economic cooperation forward.
- In inter-regional trade, there have been shifts in the destinations of the ASEAN countries' exports. Although Japan, the EU and the NAFTA are still dominant trade partners, China (Mainland), Hong Kong and Taiwan have increasingly become important destinations to the ASEAN countries' exports. Meanwhile, the five original ASEAN members have still dominated the intra-regional trade (95 percent) in the ASEAN region. There is positive relationship between the size of country and the share of intra-regional trade in the region. The intra-regional trade in the ASEAN region has been larger (intense) than expected, given the ASEAN's importance in the world trade, excepting Cambodia.
- There have been changes in the pattern of comparative advantage; therefore, it must be examined in the dynamic sense rather than as static matter. The ASEAN has exhibited the most dynamic change in the pattern of comparative advantage, followed by China, Korea and Japan. The ASEAN, China and Korea have shown increases in overall comparative advantage together with decreases in the standard deviation. This implies that the increase in overall comparative advantage is encouraged by the higher increase in comparative advantage of products which had no or lower comparative advantage in the past.
- The H-O theory is constructed under strict assumptions. The H-O theorem does not necessarily hold when assumptions on production and consumption are violated. The static comparative advantage can only explain inter-industry trade but not intra-regional trade. China, Indonesia and Thailand have comparative advantage in *unskilled* labor-intensive industry, meanwhile only Japan has comparative advantage in *technology*-intensive industry for the last two decades.
- The East Asian countries have exhibited despecialization together with convergence in the pattern of comparative advantage which might indicate the existence of intra-regional trade in the region. China, Thailand and Indonesia have shown more dynamic despecialization. In general, such descpecialization processes are different across countries as well across industries.
- The 'Flying Geese' pattern is recognized in the case of the East Asian region. The industries in the first round of the FG pattern are *unskilled labor*-intensive industries, followed by *human*

capital-intensive industries in the second round and *technology*-intensive industries in the third round.

- By employing a new version of the CMS derived in this thesis, we find that the constant share norm seems powerful in explaining a country's exports performance since the mid 1980s. In the case of China, the general rise in world export can only explain about 30 percent of the China's change in exports. The more dominant factor underlying China's exports has been the market share effect i.e. 53 percent during 1990-1995, 80 percent during 1995-2001 and 74.5 percent during 2001-2006. The proliferation of regionalism and economic integrations in the beginning of 1990-s caused the change in trade pattern. Intra-regional trade has increased significantly. Trade creation and trade diversion occur. However, this thesis finds that the change in trade pattern happened only in the short period (in the beginning of economic integrations) i.e. 1990-1995 in the case of the EU, the North East Asia and the ASEAN5 and 1995-2001 in the case of the NAFTA.
- By using a modified intra- and inter-industry trade measures (incorporating intra- and inter-regional trade), we find that intra-regional trade increased significantly in the case of the East Asia and the NAFTA. As the importance of the intra-industry trade increases, the dominance of inter-industry trade decreases in the East Asia. Intra-industry trade in intra-regional trade has larger increases than that in inter-regional trade in the East Asia.
- The three widely used methods in analyzing PPP i.e. univariate time series of Real Exchange Rate (RER); multivariate regression; and Johansen framework of multivariate cointegration gives the same conclusion that the PPP hypothesis does not hold in the strong sense in the case of all selected East Asian countries. Japan and Hong Kong have opposite signs of estimated coefficients with that of the PPP theory postulates. In general, the Balassa-Samuelson effect plays significant role in causing deviation away from PPP.
- Indonesian industrial and trade policies follow the statement of a supporter of trade liberalization; 'good times mean bad policies and bad times mean good policies'. Effective Rate of Protection (ERP) analysis shows that Indonesian manufacturing sector has become more liberalized i.e. starting from very high rate of protection during inward-looking regimes to the lower rate of protection after the Asian financial crisis onward.

Notes

(1) The 'flying geese' paradigm was introduced by Kaname Akamatsu in the 1930s in the several articles available only in Japanese. Kaname Akamatsu showed himself in the world academia after the World War II in the two articles (1961, 1962) in English. 'Flying geese' model intends to explain the catching-up process of industrialization of latecomer economies from intra-industry, inter-industry and international aspects. It might be argued that the structural transformation of industrialization in East Asia follows this 'flying geese' formation. Garment, Steel, Popular TV, Video and HDTV are frequently used to illustrate the formation. Those products have been transferred from Japan to Newly Industrialized Economies (NIEs: Hog Kong, Taiwan, Singapore and Korea); from NIEs to the ASEAN4 (Malaysia, Indonesia, Thailand and the Philippines); from the ASEAN4 to latecomer economies.

(2) The other ASEAN countries are excluded from the analysis due to unavaiability of the data.

(3) This chapter uses RSCA instead of RCA for some reasons proposed by Volrath (1991), Laursen (1998) Aiginger (1999) and Wörz (2005) among others. First, RCA is basically not comparable on

both side of unity since the index ranges from zero to infinity. A country is said not to be specialized in a given product if the index ranges from zero to one. In contrast, a country is said to be specialized in a given product if the index ranges from one to infinity. Second, if RCA is used in estimating the econometric model, one might obtain biased estimates. RCA has disadvantage of an inherent risk of lack of normality. A skewed distribution violates the assumption of normality of the error term in regression analysis, thus not providing reliable inferential statistics. Third, the use of RCA in regression analysis gives much more weight to values above one, when compared with observation below one.

学位論文審査要旨

問題関心　　多角的貿易システムの下にあっても地域的貿易協定がいくつも締結され，EU，NAFTA，MERCOSUR，ASEAN-FTA (AFTA)，など地域経済統合が進展した。地域貿易協定や地域経済統合は，加盟国および非加盟国にとっては貿易創出効果，貿易転換効果といったプラスまたはマイナスの経済効果をもたらすことはよく知られている。東アジア地域では，事実上の (*de facto*) 経済統合は進展してはいるが，条約上の (*de jure*) 地域経済協定に進むのが遅かったことは確かである。

地域貿易協定，地域経済統合，二国間貿易協定，等は，諸国の比較優位と特化パターンに影響を与える。東アジア諸国における比較優位と特化における一連の諸変化は，東アジア諸国における経済統合の将来展開に大きな影響を与える。雁行形態型経済発展論によれば，比較優位における一連のシフトが存在しているといえることになる。そのようなシフトは，日本から新興工業経済群（NIE s）へ，さらにはアセアン-4（マレイシア，インドネシア，タイ，フィリピン）等へと受け継がれてゆく標準化された労働集約的工業製品においてよく見られてきた。

次に，国際貿易における重要な問題の一つは為替相場の問題である。実際，名目為替相場は，一国の競争力を左右する。一物一価の法則によると，運送費ゼロ，貿易障害ゼロ，同一通貨で評価され，かつ各国で同一財が流通する世界では，どこの国でも財価格はただ一つに決まるだろう。いったん共通の通貨に換算されれば，国々の間では物価水準は同一になる，というのが購買力平価説上の命題である。購買力平価説は，二国間の為替相場の変動と物価水準の変化を説明してくれる。先進諸国については購買力平価説を検証する文献は多数あるが，発展途上国については，その国際貿易上に占める位置が高まっているにもかかわらず，文献は比較的少ないのである。

以上のような問題関心の下に，本論文は以下のような全体構成をとっている。

Chapter　1　Introduction
Chapter　2　The Evolution of ASEAN
Chapter　3　Major Trade Trends in the ASEAN Region
Chapter　4　Shift in Pattern of Comparative Advantage
Chapter　5　Factor Endowments and Comparative Advantage
Chapter　6　Dynamic Specialization and Convergence in Trade Pattern
Chapter　7　Flying Geese and “Products Mapping”

Chapter 8 Export Performance: Constant Market Shares Analysis
Chapter 9 Intra-Regional and Intra-Industry Trade
Chapter 10 Purchasing Power Parity Adjusted Non-Traded Goods
Chapter 11 Structure of Protection in Manufacturing Sector: Indonesian Case Study
Chapter 12 Concluding Remarks
References
Supplements
Appendixes (on CD)

の全12章，参考文献リスト，補遺及び付録（計算結果の表が中心，CD にも収録）となっていて，A4 サイズの用紙に英文で，本文320頁，参考文献リスト16頁，補遺30頁及び CD に収録の付録（約350頁）の力作である。

本論文の目的は，東アジア諸国の経済統合，比較優位，及び購買力平価について検討することである。第１章・序文では，次のように10個の質問を提示している。

①東アジアでの最初の経済統合体は，アセアンであるが，この *de jure*（条約上の）経済統合体はどのような変遷をたどったか？世界的なリージョナリズム（地域主義）の展開に対応してアセアンの焦点はどのように変化したか？

②アセアン諸国の要素賦存は相対的に類似していて，代替関係が存在しているので，アセアンの展開に関しては懐疑的見解がよく見られたのであるが，アセアン地域における貿易趨勢はどのように展開したか？

③外国からの直接投資（FDI，ここでは対内直接投資）は相対的要素賦存に影響を与え，一国の比較優位が力強く変化しうるのであるが，東アジア諸国の比較優位パターンはどのようにシフトしたか？

④ヘクシャー=オリーン理論は，一国はその相対的に豊富な生産要素を集約的に用いた財に比較優位を持つことを示唆するが，要素賦存の変化は諸国の比較優位にどのように影響したか？

⑤東アジア諸国の貿易特化・貿易パターンはどのような方向に向かっているか？

⑥経済のキャッチングアップ過程についての理論としては，「雁行形態論」がよく知られているが，東アジア地域にはこのようなパターン「輸入―国内生産―輸出―逆輸入」（M-P-E-M）は存在しているか？

⑦リージョナリズムと経済統合は諸国の輸出パフォーマンスに影響を与えるが，東アジア諸国の輸出に対する力強い市場はどこだったのか？

⑧東アジア諸国における産業内貿易と地域内貿易はどのように進行したか？地域内貿易における産業内貿易は，地域内における産業間貿易と比べて顕著になっただ

ろうか？

⑨東アジア諸国の場合には購買力平価説は強い意味で有効であったか？

⑩本論文では，ケーススタディとしてインドネシアを取り上げるが，インドネシアの製造業部門における保護の構造はどのようであったか？

第２章から第11章までで上記の10個の質問に答える構成になっている。研究の枠組みは，図１で示された通り，比較優位の問題，ダイナミックな市場，為替相場の問題，の三つに分け，それぞれの系列に応じて異なった分析手法を用いている。第２章では，アセアン諸国は当初の政治的関心から，のちには経済的関心へと焦点を移していったことを論じていて，図１の枠組みに対する前提となっている。アセアンにおけるこのような展開は，経済リージョナリズムの世界的傾向と1980年代および1990年代における貿易自由化の時期と歩調を揃えるものであった，とする。

第３章では，アセアン地域の域内貿易を調べ，日本，EU，NAFTA は依然として大きな市場ではあるが，中国（本土），香港，台湾，がアセアン諸国の輸出仕向け地としてますます重要になって来ていること，アセアン地域の域内貿易が，世界貿易に占めるアセアンの重要性以上に重要になって来ていることが，貿易結合度指数（Trade Intensity Index, TI）による分析の結果として明らかになったとする。

第４章では，統計的手法を応用して，一体としてのアセアン５カ国（シンガポール，インドネシア，マレイシア，タイ，フィリピン）グループ，日本，韓国，中国，

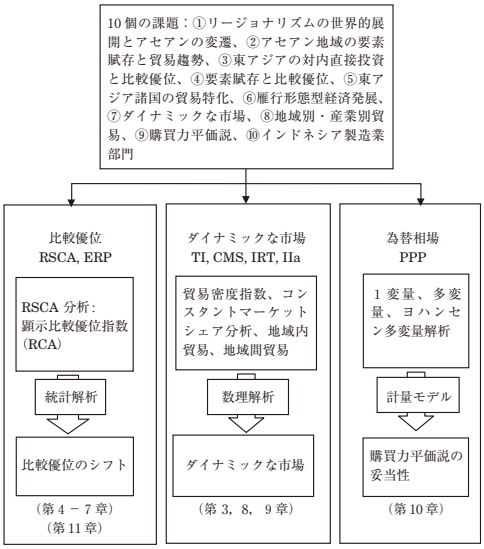


図１．研究の枠組み

について比較優位パターンのシフトを分析する。そして，アセアン諸国の比較優位パターンの変化が最も力強かったこと，次に来るのが中国，韓国，そして日本と続くことを述べる。さらに，比較優位は静学的にではなく動学的な観点から検討すべきことを述べ，第5-7章及び第11章における更なる検討への前触れとしている。

第5章では，一国の要素賦存とその比較優位との間の関係についてより理論的な分析を行なう。すなわち，最近の20年間については中国，インドネシア，タイは未熟練労働集約的な産業に，日本は技術集約的産業に比較優位を持つと論じる。さらに，東アジアにおいてはダイナミックな特化が行なわれており，しかも，雁行形態的展開が観察されるとして，第6-7章への前触れとしている。

第6章では，東アジア諸国の貿易パターンは力強い特化と収斂を示していることを論じる。東アジア諸国は比較優位パターンの収斂とともに特化度の低下も示している。このことは地域内での産業内分業が増大していることを示唆しており，このことは，第9章でさらに議論される。

第7章では，東アジアにおける雁行形態的経済発展について分析する。ここでは，東アジア地域においては，雁行形態型経済発展がみられ，しかもその初期には未熟練労働集約産業，次には人的資本集約産業，さらには技術集約産業へと進んでゆくことが示される。

第8章では，東アジア諸国のダイナミックな輸出市場について CMS（Constant Market Share）手法を用いて分析している。この手法は，1980年代以降世界的貿易パターンの変化と各国独自の変化の効果とを分離するものであり，一国の輸出パフォーマンスを説明するのに強力であると考えられている。1990年代初め以降のリージョナリズムと経済統合の広がりは，貿易パターンの変化を引き起こしているが，この貿易パターンの変化は，EU，東アジア，アセアン-5の場合に1990-1995年期間に，NAFTA の場合の1995-2001年期間に見られたように，短期間（経済統合の初期）に起こるだけであることが分かる。

第9章では，東アジアにおける地域内及び地域間の産業間貿易及び産業内貿易の現象を分析している。（地域内および地域間貿易を組み込んだ）修正された産業内および産業間貿易測度を用いて計測したところ，東アジアおよび NAFTA の場合には地域内貿易が顕著に増加していることが分かった。東アジアにおいては産業内貿易の重要性が増すにつれて，産業間貿易のウェイトが減少している。そして，地域内貿易における産業内貿易のウェイトが地域間貿易のそれよりもさらに大きな増加をみているのである。

第10章では，東アジア諸国の場合における購買力平価仮説を検証している。購買

力平価分析の場合によく用いられる手法を用いて分析を行なっているが，取り上げられた東アジア諸国のすべてについて，購買力平価説は強い意味においては妥当しないと結論できる。バラッサ・サムエルソン効果（貿易財と非貿易財との間の生産性格差存在が均衡相対価格に及ぼす効果）は東アジアでも大きく，購買力平価からの乖離が引き起こされるのである。

第11章では，インドネシアの製造業部門における保護の構造についての事例研究が行なわれている。ここでは，インドネシアの投入産出表及び関税データが用いられていて，保護の程度，すなわちバラッサが提唱した実効保護率は低下していることが計算の結果によって示されている。

第12章では，結びのための諸説明が行なわれている。

References の次に追加されることになった Supplements（補遺）では，第 4 章及び第 6 章内の計量経済学的方法を用いた推定に関して，予備審査の段階で改めて検算が行なわれた結果，推定結果は十分な精度を持っていることが確認された。この点に関しては，脚注にするよりも「補遺」にする方がより丁寧に記述できると考えられたため，本文中には含めなかった。なお，筆者はこの確認作業の中で，将来的にはさらなる展開に至りうる新しい結果も得ている。

なお，本論文内のいくつかは国際セミナー，コンファレンス，等で報告されて，コメントを受け，いくつかのジャーナルにも発表された。また，本論文で用いられた実証分析ツールの若干は国際経済学上の既存の実証分析ツールの改善にも貢献している。

①第 4 章では，二国の Revealed Symmetric Comparative Advantage（顕示対称比較優位，RSCA）の間のスピアマン順位相関係数についての静学的テストを行なうことによって，二国間の比較優位の長期的収斂を分析するのであるが，そのための手法を改良している。

②第 6 章では，諸国のダイナミックな特化の検証のために適用されることが多い計量モデルにおいてダミー変数を導入している。

③第 7 章では，RSCA と貿易収支指標を組み合わせて，新しい分析ツールとして「製品競争力分布図」を考案し，雁行形態パターンの分析に適用している。雁行形態型経済発展モデルは，1930年代に赤松要教授が提唱されたもので，その後同教授による英文論文の発表（1961年発行の*Weltwirtschaftsliches Archiv*）とともに国際的に知られるようになった。第7章では，この雁行形態型発展モデルを東アジアに関して実証的に検証している。

④第 8 章では，リーマー＆スターン，ティシンスキ等による分析ツール CMS

（Constant Market Share）に，リチャードソンやフェイガーバーグ=ソリー達が指摘したいくつかの弱点を考慮して改良を加え，若干の地域及び国々の輸出パフォーマンスの分析に応用している。リーマー達の 4 個の項目プラス誤差項の内の誤差項をさらに二つの項目に分離することによって，四つの効果しか分析できなかったのを，六つの効果の分析が可能になる様に改良して，より精密な分析をできるようにした。なお，ちなみにこの改良 CMS を用いた論文は，ガジャマダ大学における論文コンペで 1 等賞を受賞している。

⑤第 9 章では，グルーベル=ロイド（1975）による産業間貿易及び産業内貿易の分析ツールを改良し，地域間貿易及び地域内貿易の分析を行えるようにした。この改良された算出式は，「地域内産業内分業指数」と呼ぶことにしている。

以上のように，従来からの分析用具に改良・改善を加えつつ，さまざまな分析を行ない，博士学位請求論文に仕上げている。

なお，参考までにウィドド氏が本学在学中に発表した論文のリストを次に掲げる。これらの他に，国外での学会報告を 1 回，国内での学会報告を 2 回行なっている。

2008 “Products Mapping” and Dynamic Shift in the Patterns of Comparative Advantage: Could India catch up China?’, *HUE Journal Economics and Business* 29(5): pp.147–69.

2008 ‘Structure of protection in Indonesian manufacturing sector’, the Forthcoming *ASEAN Economic Bulletin,* Vol. 25, No.2: pp. 161–78.

2008 ‘Japanese “Flying Geese” and Its Implications for China”, *The Journal of Chinese Economic and Foreign Trade Studies,* Vol. 1, No.3.: pp. 200–13.

2008 ‘Shift in Pattern of Specialization: Case Studies of China and India’, the Forthcoming *Gadjah Mada International Journal of Business*, Vol. 10, No. 1.

2008 “The Method of Constant Market Shares (CMS) − Competitiveness Effect Reconsidered: Case Studies of ASEAN Countries’, *Journal of Indonesian Economy and Business,* Vol. 23. No.3.

2008 ‘Factor Endowments and Comparative Advantage of East Asia’, *Economics and Finance in Indonesia,* Vol. 56, No.2.

2007 ‘Productivity Differentials and Purchasing Power Parity: Cases of Indonesia and Korea’. *HUE Journal of Economics and Business,* 29(5): 147–69.

2007 ‘Economic and Environment Impact of Trade Liberalization in Manufacturing

Sector', *Economics and Finance in Indonesia,* Vol. 55, No.1 (2007):1–31.

2007 'European Presence in Indonesia'. *Asia Europe Journal.* 5(3): 381–99.

2007 'Non-traded Goods and Purchasing Power Parity Deviation: Evidence from ASEAN countries'. *Journal of Indonesian Economy and Business* 22 (1):43–56.

2006 'Demand Estimation and Household's Welfare Measurement: Case Studies on Japan and Indonesia'. *HUE Journal of Economics and Business* 2 (2): 103–36.

2006 'From Dutch Mercantilism to Liberalism: Indonesian Historical Perspective'. *Journal of Indonesian Economy and Business* 21 (4):323–43.

2006 'The Roles of Informal Sector in Regional Economy: Delphi-IO Approach and Application'. *Journal of Indonesian Economy and Business* 21 (3) (In Indonesian).

審査員一同は，ウィドド氏の本学大学院における単位の取得状況が博士号取得の条件を満たしていることを確認した上で，平成20年12月6日に最終面接試験を実施した。この面接試験では，審査委員達からの様々な角度からの質問に対しても，的確に応答していた。審査委員会では，その結果をも踏まえて本論文が博士（経済学）の学位論文として適格であると判断する。

平成20年12月25日

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