TRADE AND ECONOMIC GROWTH IN VIETNAM AFTER DOI-MOI: A COMPARATIVE STUDY WITH THE ASEAN-4

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Trade and Economic Growth in Vietnam after Doi-Moi:

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Abstract

This thesis studies the role of exports in Vietnam's rapid growth since the country implemented a comprehensive reform (Doi-Moi) in 1986 to transform itself from a centrally command system to a 'socialist-oriented market economy'. One central finding is that Vietnam's growth since Doi-Moi has indeed been export-led as the second-tier NICs of Malaysia, Thailand and the Philippines, but that many of the characteristics of Vietnam's exports are different to those of these NICs. Vietnam's exports are focused on resource-intensive and low-tech industries, which are growing slowly in world trade, and in a constant market share model are explained by rising residual competitiveness rather than by market demand or commodity composition effects. This rising residual competitiveness stands at odds with the results of the World Economic Forum and other sources that Vietnam's competitiveness is low and falling in recent years. Another key finding is that since 2000 Vietnam's growth has been extensive rather than intensive, with labour productivity both at low levels and growing slowly outside the agricultural sector. High GDP growth since 2000 has been driven by rapid growth in factor supplies, especially labour, with low growth in non-agricultural productivity. This extensive pattern of growth resolves the competitiveness paradox, as it suggests that Vietnam is expanding low-cost industries rapidly but not building its competitiveness in other areas. Such a development path will not support the rate of long-term growth that Vietnam requires to achieve its development objectives, and major policy changes are necessary.

Declaration

I hereby declare that this thesis, entitled 'Trade and Economic Growth in Vietnam after Doi-Moi: A Comparative Study with the ASEAN-4', being submitted to Victoria University for the award of the **Degree of Doctor of Philosophy**, was carried out entirely by myself at the Centre for Strategic Economic Studies, Melbourne. This thesis is no more than 100,000 words in length, exclusive of tables, figures, footnotes, appendices and references and has not, either wholly or partly, been submitted for any other degree.

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May God bless you all wherever you are!

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Tri-Dung Lam

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Acronyms and Abbreviations

ADF	Augmented Dicker Fuller
AFTA	ASEAN Free Trade Area
ASEAN	Association of Southeast Asian Nations
BTA	Bilateral Trade Agreement
CCI	Current Competitiveness Index
CMEA	Council for Mutual Economic Assistance
CI	Competitiveness Index
CPRGS	Comprehensive Poverty Reduction and Growth Strategy
ECM	Error Correction Model
EGT	Endogenous Growth Theory
EP	Export Promotion
EPI	Export Penetration Index
EPIS	Export Promotion Industrialisation Strategy
EPS	Export Promotion Strategy
ERP	Effective Rate of Protection
EXP	Export
GATT	Generalised Agreements on Tariffs and Trade
GCI	Growth Competitiveness Index
GCI	Global Competitiveness Index
GCR	Global Competitiveness Report
GDP	Gross Domestic Product
GSP	Generalised System of Preferences
H-O	Heckscher-Ohlin
IRF	Impulse Response Function
IRS	Increasing Returns to Scale
IS	Import Substitution
ISI	Import Substitution Industrialisation
ISIS	Import Substitution Industrialisation Strategy
LREXP	Log Real Export
LRGDP	Log Real Gross Domestic Product

NICs	Newly Industrialising Countries
NGT	New Growth Theory
NTT	New Trade Theory
OLS	Ordinary Least Square
RCA	Revealed Comparative Advantage
RCAI	Revealed Comparative Advantage Index
R&D	Research and Development
REXP	Real Exports
RGDP	Real Gross Domestic Product
RTA	Regional Trade Agreement
SME	Small Medium Enterprises
SI	Similarity Index
SOE	State Owned Enterprises
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNIDO	United Nations for Investment and Development Organisation
VAR	Vector Auto Regression
WEF	World Economic Forum
WTO	World Trade Organisation

Map of ASEAN-5

Note: ASEAN-4 countries consist of Indonesia, Malaysia, the Philippines and Thailand.

Summary

After reunification in 1975, the government of the Socialist Republic of Vietnam extended its Soviet-style command economic model to the formerly capitalist South Vietnam by focusing on heavy industrialisation at the expense of agriculture, services and light industry. The whole economic activities were in the hands of the Central Committee Politburo of Vietnam Communist Party (VCP), who allocated resources and set production targets for the state-owned enterprises (SOEs) and cooperatives to achieve. However, the prices of production inputs and basic necessities were set unnaturally low leading to chronically misallocated resources.

During the first five years after reunification, the VCP nationalised all the businesses and private sectors, collectivised the household agriculture and foreign trade was monopolised by the SOEs. However, these policies were unproductive in the South due mainly to farmer non-cooperation. In addition, the heavy costs of the war with Cambodia (1978-89), a military 'lesson' given by the Chinese reprisals in northern borders (1979) and the trade and investment embargoes from the West restrained Vietnam's economic development. In 1979, the VCP strengthened further its implementation of central planning as well as purged private businesses and industry in the South. This led to a disastrous collapse of Vietnam's economy in which per capita income drastically dropped to such a low level that Vietnam was regarded as one of the poorest countries in the world. Vietnam was forced to make radical changes to survive and improve its economic development. In December 1986, the Sixth Party Congress decided that Vietnam must adopt a comprehensive economic reform program known as Doi-Moi (renovation). Doi-Moi was designed to remedy the inefficiencies of the State industrial sector, to reorganise the development of the non-state agricultural sector and to gradually liberalise an economy rapidly responding to market forces. Its objectives were to encourage foreign investment, to trim down the role of the State bureaucracy in the system and to remove many of the constraints on the private sector.

Since Doi-Moi, there were two export booms that significantly boosted growth in Vietnam's exports. The first one was in 1989 and the second one occurred after the US-Vietnam Bilateral Trade Agreement (USV-BTA) took effect in December 2001. For the first ten years after Doi-Moi (1986-1996), the annual average growth rate of Vietnam's merchandise exports was, at 25 per cent, higher than that of the countries of ASEAN-4[1] at 12 per cent, 19 per cent, 15.6 per cent and 20 per cent respectively. The second decade from 1996-2006 also witnessed a widening disparity in the growth rate of merchandise exports between Vietnam and the ASEAN-4. While Vietnam's annual average growth rate still remained in two digits at 18.5 per cent, those of the ASEAN-4 countries dropped to only one digit rates, at approximately 7.5 per cent for Indonesia and Malaysia and nearly 9 per cent for the Philippines and Thailand.

Among the ASEAN-5, Vietnam's GDP growth rate was also highest at 7 per cent average[2] over 1986-2006, followed by Malaysia (6.4 per cent), Thailand (6.0 per cent), Indonesia (5.2 per cent) and the Philippines (3.9 per cent).

These data raise the question of why Vietnam was achieving such high rates of growth in exports and GDP relatively to these countries of ASEAN. To provide a partial response to this question, this thesis aims to provide some answers to the following research questions:

- What has been the role of exports in Vietnam's economic growth after Doi-Moi?
- What are the main characteristics of Vietnam's exports in terms of comparative advantage, degree of specialisation, commodity and technology composition and so on?
- What were the main sources of exports growth?
- How is Vietnam's export structure compared to that of the ASEAN-4, and its future development path?
- What can be said about Vietnam's long-term export potential, and about the quality of the economic growth that Vietnam has achieved over this period?

[1] The ASEAN-4 consists of Indonesia, Malaysia, the Philippines and Thailand. While this order is represented for the ASEAN-4 throughout this study, the ASEAN-5 includes Vietnam in the fifth position.

[2] Vietnam's GDP annual growth rate was 7.5 per cent average over 2000-06.

Chapter Two follows to lay the groundwork for the empirical analyses throughout the thesis. This chapter briefly reviews six international trade theories in the history of development economics that are seen as relevant to this analysis, namely: (1) the Heckscher-Ohlin theory, which consists of (i) the factor price equalisation theorem, (ii) the Stolper-Samuelson theorem, (iii) the Rybczynski theorem, (iv) the Heckscher-Ohlin theorem and (v) the national welfare effects of free trade in the context of Heckscher-Ohlin theory; (2) export base theory; (3) product cycle theory and Linder's theory of representative demand; (4) the theory of cumulative causation; (5) endogenous growth theory; and (6) new trade theory.

Export-led Growth

Following the remarkable success of the 'first-tier' East Asian countries[3] in the 1970s and the 'second-tier' South-East Asian countries[4] in the 1980s, many economists and researchers have considered the export-led growth (ELG) paradigm as the right path for economic development in developing countries. It has attracted special attention, particularly in relation to the large malfunction of import substitution policies in many countries in Africa and Latin America. Vietnam is a latecomer in the process of economic development and integration into the world economy, with strong economic and export growth since the implementation of Doi-Moi, transforming its national economic policy from that of a centrally planned system to that of a market economy. It is undoubtedly a curious and interesting question for scholars, researchers and Vietnamese policymakers whether Vietnam's economic achievements in the past twenty years reflect export-led growth, growth-led exports, a bidirectional relationship or even no causality at all between exports and growth? To answer the question of causality between the two variables, real economic growth and growth in real exports of goods and services, is very important for Vietnam as well as for the ASEAN-4 countries, since it would help policymakers in designing appropriate policies to sustain the national economy on the path of long-term high growth.

Chapter Three, therefore, applies a bivariate system of logs real GDP and real exports of goods and services and the techniques of unit root test, cointegration test, pair-wise

[3] Hong-Kong, Singapore, South Korea and Taiwan.

[4] Indonesia, Malaysia, the Philippines and Thailand.

Granger-causality test, error correction model and impulse response function to verify both the short-run dynamics and long-run causal relationship between these two variables for Vietnam (and the ASEAN-4).

The empirical results reveal that, for short-run dynamics, bi-directional Granger-causality exists in Malaysia, the Philippines, Thailand and Vietnam while unidirectional Granger-causality runs from output growth to export growth for Indonesia. The long-run relationship shows that bidirectional Granger-causality between output and exports growth for Malaysia and Thailand; that output growth Granger-caused exports growth for Indonesia and that exports Granger-caused output growth for the Philippines and Vietnam. In the case of Vietnam, while the short-run bidirectional causality between export growth and output growth is detected by the Wald tests of vector-autoregressive model, the long-run unidirectional relationship from exports to output growth is determined by all three different techniques, the error correction model, the pair-wise Granger causality test and the impulse response function in vector-autoregressive model.

In brief, it can be said in other words that the export-led growth hypothesis is supported for Vietnam and that exports were really an engine of growth enhancing Vietnam's GDP growth over the period studied (1989-2006) and in the long run. More specifically, exports are a determinant foundation for Vietnam's economic growth as in the case of the second-tier NICs of Malaysia and Thailand in the short run dynamics and as the Philippines in the long run.

Characteristics of Vietnam's Exports

Since Vietnam's economic growth has been driven in part by exports, Chapter Four investigates the characteristics of Vietnam's exports over the 1997-2003[5] period by using Balassa's revealed comparative advantage index, which measures a country's share of world exports of a given commodity or industry relative to that country's overall share in world exports. When the RCA index is greater than one for a given commodity or industry, the country may be said to have a comparative advantage in

[5] Vietnam's disaggregated data at the 3-digit SITC (revision 3) level are available only from 1997 to 2003.

that commodity or industry. Measured by the coefficient of variance of RCA indices at the SITC three-digit level, Vietnam was the most specialised of the ASEAN-5 after the Philippines, and was considerably less diversified than Thailand and Indonesia. Specifically, among the ASEAN-5, Malaysia and the Philippines specialised in high-tech export products while Indonesia and Thailand continued their industrialised path by diversifying their export sectors. Indonesia diversified in natural resource-based and low-tech industries; and Thailand diversified in various industries, especially in medium-high-tech and high-tech ones. In the case of Vietnam, it appears that slightly increased standard deviation and coefficient of variance also support a specialisation trend in Vietnam's exports of mainly resource-intensive and low value-added products, in which it is more adept than the second-tier NICs. The analysis of Vietnam's top-twenty exports at the three-digit level in 2003, which accounted for 79 per cent of total merchandise exports, shows that natural resource-based and low-tech industries contributed 74 per cent, of which natural resource-based industries contributed 38 per cent and low-tech industries 36 per cent. The remaining 5 per cent included 0.9 per cent from medium-low-tech industries, 1.6 per cent from medium-high-tech industries and 2.5 per cent from high-tech industries. By contrast, in the Philippines, Malaysia and Thailand respectively the share in the top-twenty export products contributed by the high-tech industries was 70.2 per cent, 53.2 per cent and 26.6 per cent respectively (see Table 4.12).

Table S.1 below shows all Vietnam's revealed comparative advantage industries in 2003 in which none of them belonged to high-tech industry, and only one in medium-low-tech (cycles, motorcycles etc.) and another in medium-high-tech industry (electrical distributor equipment n.e.s.).

It should be noted that in Vietnam, and indeed in the ASEAN-4 countries, the production for export of high-tech products substantially consists of low value-added assembly of high-tech inputs from external outsourcing. This does not mean that the category is unimportant, but that it should not be taken to imply high value-added production activities.

Table S. 1: Vietnam's Revealed Comparative Advantage Industries in 2003

SITC Rev.3	Natural resource-based industries	US$ billion	RCA	SITC Rev.3	Low-tech industries	US$ billion	RCA
022	Milk and cream	0.067	1.5	592	Starches, Inulin, etc.	0.089	2.6
034	Fish, fresh, chilled, frozen	0.379	5.9	612	Manufactured leather etc. n.e.s.	0.009	1.5
035	Fish, dried, salted, smoked	0.052	7.3	621	Materials of rubber	0.054	2.1
036	Crustaceans, molluscs etc.	1.643	39.4	635	Wood manufactures n.e.s	0.077	1.7
037	Fish etc. prepared, preserved. n.e.s.	0.122	4.4	651	Textile yarn	0.131	1.5
042	Rice	0.720	43.0	658	Textile articles, n.e.s	0.162	2.7
121	Tobacco un-manufactured	0.018	1.3	663	Mineral manufactures, n.e.s	0.143	3.3
122	Tobacco manufactured	0.109	2.7	696	Cutlery	0.027	1.7
222	Oilseed (sft. fix veg. oil)	0.057	1.2	821	Furniture, cushions, etc.	0.644	3.2
223	Oilseed (oth. fix veg. oil)	0.006	2.8	831	Trunk, suit-cases, bag, etc.	0.243	4.9
231	Natural rubber, etc.	0.378	24.5	841	Men, boys clothing, x-knit	1.079	10.0
245	Fuel wood, wood charcoal	0.004	3.8	842	Women, girl clothing, x-knit	0.634	4.4
246	Wood in chips, particles	0.028	5.6	843	Men, boys clothing, k-nit	0.320	10.7
261	Silk	0.002	2.9	844	Women, girls clothing. knit	0.432	7.8
265	Vegetable textile fibres	0.011	5.0	845	Other textile apparel, n.e.s	0.824	4.4
287	Ore, concentrate base metals	0.048	3.2	846	Clothing accessories, fabric	0.097	2.5
321	Coal, not agglomerated	0.188	3.6	848	Clothing, non-textile; headgear	0.080	1.8
333	Petroleum oils, crude	3.821	6.0	851	Footwear	2.299	16.2
687	Tin	0.009	2.6	899	Misc. manufactured goods n.e.s.	0.174	1.9
	Medium-low-tech industry				**Medium-high-tech industry**		
785	Cycles, motorcycles, etc.	0.177	2.8	773	Elect. distributor equipment n.e.s.	0.292	2.5

Source: Author's calculation based on UN Comtrade database.

In addition, nonparametric tests consisting of two periods: (1) 1997-2001 using the average world export growth and RCA indices of 247 product categories, aggregated into 23 groups at the three-digit SITC (Rev. 3) level; and (2) 2001-06 using the average world export growth and RCA indices of 97 product categories at the two-digit HS (2002) level show that, over these two periods, changes in comparative advantage for Vietnam were negatively correlated with the average world export growth vector, yielding the Spearman rank coefficients of –0.358 and –0.144 respectively for Vietnam with these results significant at the 0.10 level (10 per cent). This implies that Vietnam was not able to gain comparative advantage in the more rapidly growing industries in world trade, and thus the changing structures of Vietnam's comparative advantage were not necessarily beneficial for the long-term growth of its exports. For instance, over 1997-2001, while the average world export

growth rates of product groups such as miscellaneous manufactures (HT),[6] other transport equipment (MH), power generating machinery (HT), non-electrical machinery (MH), scientific and control instruments (HT), pharmaceuticals (HT) and automotive products (MH) were relatively high, at 6 per cent, 10 per cent, 16 per cent, 6 per cent, 11 per cent, 20 per cent and 7 per cent respectively; in each of these industries Vietnam had a comparative disadvantage.

On the other hand, with the exception of fuels for which the growth of world demand was high at 18.6 per cent per annum, all of Vietnam's major comparative advantage export industries such as personal and household goods, clothing, food, fuel and raw material were slowly-growing industries in world trade.

In contrast to findings of Chapter Three that Vietnam's export-led growth hypothesis is analogous to the second-tier NICs, the results of this Chapter Four demonstrate that the characteristics of Vietnam's export structure are fairly convergent to Indonesia, a lagger of the ASEAN-4, and divergent to the second-tier NICs. In other words, while Vietnam's and Indonesia's export structures have specialised in the natural resource-based and low-technology intensive industries, those of Malaysia, the Philippines and Thailand have concentrated more on high-technology intensive industries.

Sources of Vietnam's Export Growth

Having shown that the export-led growth hypothesis is demonstrated for Vietnam in Chapter Three, and that Vietnam's exports were specialised in natural resource industries and low-technology industries with generally slow growth in world trade; Chapter Five then investigates the sources of export growth by using two approaches. The first one is the constant market share model which decomposes the change in exports into four effects: *(1)* the world trade demand effect; *(2)* the commodity composition effect; *(3)* the market distribution effect; and *(4)* a residual competitiveness effect. The formula is expressed as below:

[6] HT = high-technology; MH = medium-high-technology; ML = medium-low-technology; LT = low-technology.

$$X^{\circ\circ} - X^{\circ} = \underbrace{rX^{\circ}}_{(1)} + \sum_i \underbrace{(r_i - r)X_i^{\circ}}_{(2)} + \sum_i \sum_j \underbrace{(r_{ij} - r_i)X^{\circ}_{ij}}_{(3)} + \sum_i \sum_j \underbrace{(X_{ij}^{\circ\circ} - X_{ij}^{\circ} - r_{ij}X^{\circ}_{ij})}_{(4)}$$

Where: X = ASEAN-5's total exports

X_{ij} = ASEAN-5's exports of commodity i to market j

X_i = ASEAN-5's total exports of commodity i

r = growth rate of total world exports

r_i = growth rate of total world exports of commodity i

r_{ij} = growth rate of world exports of commodity i to market j

^{0} = initial period

^{00} = second period.

The results of the empirical analysis for 1997-2006 show that while the commodity composition and market distribution effects each had a negative impact on Vietnam's exports, the sources of export growth in Vietnam over the period studied were the general rise of world trade demand and an unexplained residual competitiveness effect. Thus, Vietnam's export growth was supported by strong growth in world trade over the period, but hindered by the commodity composition of those exports and by the nature of the markets to which Vietnam exports. In this context, a key factor driving exports was an increasing capacity of Vietnam's exports to penetrate the markets of its partner countries. This increasing residual competitiveness is not explained by this analysis, but may reflect the fact that Vietnam is an emerging exporter with low labour costs starting from a low export base.

It is noted that, in the constant market share model, the two external demand-oriented effects of world demand and commodity composition for some particular industries tended to have the same effect on each of the ASEAN-5 in a fairly analogous manner. On the other hand, the internal factor, the supply-oriented competitiveness effect, varied largely between Vietnam and the ASEAN-4. In other words, the characteristics of Vietnam's export performance have been different to those of the second tier NICs as confirmed in Chapter Four.

The second approach uses the survey results of the World Economic Forum's global competitiveness index, based on perceptions of the efficiency of an economy's macro-

and microeconomic structural change, which shows that Vietnam's structural and institutional competitiveness has been declining, and has become quite low in international terms. Specifically, among the ASEAN-5, Malaysia's competitiveness ranking is highest, followed by Thailand, the Philippines and Indonesia. Vietnam's ranking (60th) was higher than Indonesia (72nd) and the Philippines (66th) only in 2003. Since then, while Indonesia's competitiveness has improved amazingly, overtaking the Philippines from 2004, Vietnam's competitiveness fluctuated around 70th ranking until 2008.[7]

These two findings stand in apparent opposition to one another. The constant market share model shows that a rising revealed competitiveness has driven Vietnam's exports during this period, and offset the disadvantage of poor commodity and market composition. On the other hand the WEF's surveys suggest that Vietnam's international competitiveness is low and has been declining in recent years. One possible explanation, consistent with the findings of Chapters Three to Five to date, is that the rising revealed competitiveness reflects Vietnam's ability to develop, with the use of foreign capital, increased production and exports in labour-intensive industries, even as its ability to compete in higher value goods and service industries, falls away. The attempt to interpret this apparent opposition, and its implications for the quality of Vietnam's economic growth to date and of its future prospects, will be an important aspect of the concluding chapters of this thesis.

Comparative Export Structure and Vietnam's Development Path

As noted earlier, there is a common view that one feature of development, especially in the East Asian model, is a progressive structural change in exports from resource and labour intensive products to those, which are more intensive in terms of capital, skill and technology. In Chapter Six, two applications of this principle are used to study the structure of Vietnam's exports in relation to the ASEAN-4, and then the implications of continuing the current pattern of Vietnamese development through to 2020 are assessed.

[7] There were 122 countries in the global competitiveness index rankings for 2006-07; 131 countries for 2007-08 and 134 countries for 2008-09.

The first application uses the Finger and Kreinin (1979) similarity index, which measures the similarity in the export structures of two countries relative to a third country (here taken to be the world). Similarity indices are calculated for Vietnam relative to each of the ASEAN-4 at the 247 commodity SITC (rev. 3) level for 1997-2003, and these show that Vietnam's export structure has much in common with that of Indonesia but has little similarity to that of Malaysia, Thailand or the Philippines. A similarity analysis is also conducted at the 23-group level to compare Vietnam's export structure in 2003 with that of the ASEAN-4 countries and South Korea from 1980 to 2003. This analysis shows that Vietnam's 2003 structure was most similar with that of South Korea in 1980, with those of Malaysia, Thailand or the Philippines in 1990 and with that of Indonesia in 1994. On the basis of the structural change in exports principle, this can be taken as a measure of how far Vietnam is behind these countries.

The second application uses an adaptation of the technique of Lutz (1987) to study the changes in revealed comparative advantage (RCA) across industries over 1997-2003. One key finding is that in particular labour intensive industries in which Vietnam has high and rising revealed comparative advantage (such as clothing, textiles and personal and household goods), there is a negative correlation between changes in RCA in Vietnam and in each of the ASEAN-4 countries, illustrating the shifts of these industries from the ASEAN-4 to Vietnam. Finally, the degree of correlation between RCA indices for Vietnam in 2004 and the countries of ASEAN-4 plus South Korea over a range of years back to 1980, for twelve industries, is calculated. The results show a strong correlation only for Indonesia, and very little correlation for South Korea in 2004. The highest level of correlation with Vietnam's RCA pattern in 2004 is with that of South Korea in 1980, of Malaysia in 1990 and of the Philippines and Thailand in 1994.

One of the repeated objectives of the Vietnamese Government is to become a newly industrialising country by 2020. While there are no agreed criteria for achieving this status, it is widely recognised as linked to the transfer of resources from agriculture to manufacturing and to the achievement of a minimum standard of GDP per capita. In the light of the fact that both Thailand and the Philippines have recently been

recognised as newly industrialising countries, the characteristics of the poorer of these (the Philippines) might be taken as providing minimum conditions. In 2006, the Philippines had GDP per capita of US$1,154 in 2000 prices, with 15 per cent of value-added (and 37 per cent of employment) in agriculture and 29.6 per cent of value-added (and 14.5 per cent of employment) in industry.

To address this issue, the pattern of growth by major sectors over 2000-06 for Vietnam, is projected out to 2020. The results show that Vietnam would meet these minimum conditions by 2020 with per capita GDP of US$1,337 in 2000 prices, with the share of value-added down to 10.8 per cent in agriculture and up to 56.4 per cent in industry. But in other respects the projection raises major problems. Given the labour intensive, low productivity growth path of Vietnamese manufacturing to date, growing living standards are achieved in good part by drawing large number of people into work, with the projection suggesting 68 per cent of the Vietnamese population would be working by 2020. This is clearly not attainable. Nor, even if such labour supplies were available, would this really classify as modernising industrial growth – projected output per worker in Vietnam in 2020 is still 24 per cent below that of the Philippines in 2006.

Vietnam's Export Potential

The key findings of Chapter Three show that Vietnam's growth has been export-led, as has been that of the second-tier NICs of Malaysia, the Philippines and Thailand. But neither the characteristics of Vietnam's export structure (Chapter Four), the internal supply-oriented competitiveness effect of the constant market share analysis (Chapter Five), nor the export similarity results (Chapter Six) reflect those of these NICs. They specialised in the high value-added industries of medium-high and high-technology intensity (Chapter Four) that have attracted an increasing share of world trade. In the three respects studied Vietnam's export structure and characteristics are more analogous to those of Indonesia. The question then arises as to whether Vietnam's current rapid export growth is sustainable.

Chapter Seven, therefore, undertakes a preliminary investigation of the unexploited potential of Vietnam's manufacturing exports to assess whether it is likely that

Vietnam could sustain such a high growth rate through to, say, 2020. The methodology used follows that of Mayer and Wood (2001), and is based on two variables: human-capital resources (average years of education of the labour force) and land resources (square kilometres of land per worker). Relative to other developing countries and to the ASEAN-4, Vietnam has a highly educated workforce and a low level of arable land per capita. The analysis, based on these variables and on the Mayer and Wood relationship, suggests that Vietnam has the potential for much increased manufacturing exports. More generally, Vietnam has abundant natural resources in agriculture, fuels and mining as well as an educated labour force, suggesting that there is substantial scope for further overall growth in total exports. The results of the earlier chapters raise questions, however, about how effectively Vietnam is making use of the education and skills of its population in manufacturing, and hence whether this potential will be realised. Thus, the final chapter of the thesis addresses issues surrounding the quality of Vietnam's growth, and hence of its ability, on current policies to achieve its development goals.

The Quality of Vietnam's Growth

In the long-run, development is largely about increasing the productivity of the labour force, so this is a useful lens through which to analyse the quality of growth and the likelihood that a given growth path will contribute to effective development. In Chapter Eight labour productivity in Vietnam is analysed for key industry sectors, in the context of trends in the ASEAN-4 and in China, for the period 1990-2006. A more detailed analysis by industry in Vietnam is also undertaken, but for reasons of data availability the period is restricted to 2000-06.

At the aggregate level Vietnam's labour productivity growth has been relatively strong over 1990-2006, being at 5.2 per cent per annum the most rapid of any of the six countries other than China, and being substantially higher than that of any of the ASEAN-4. Its growth rate was also relatively stable over the period, and amounted to 5.1 per cent over 2000-06. But reflecting its low starting level, Vietnam's average productivity level remains low in 2006, being less that half that of the lowest of the other countries (Indonesia) and just over 10 per cent of that in Malaysia. This pattern of reasonably strong growth on a very low level is repeated in agriculture, with

productivity growth over 1990-2006 of nearly 4 per cent annually but a productivity level of only 56 per cent of that of the lowest country (China) in 2006. A similar pattern is also evident in the service sector, although here the growth in Vietnam's labour productivity has been towards the lower end of the ASEAN-4.

The situation is different in the two components of the industrial sector analysed, namely manufacturing and non-manufacturing industry. In manufacturing, Vietnam's labour productivity remains very low in 2006 (only 40 per cent of that in Indonesia and 35 per cent of that in China), in spite of fairly strong growth over 1990-2000, with slower growth (4.0 per cent per annum) over 2000-06. In non-manufacturing (which includes the petroleum industry), real value-added per worker in Vietnam was relatively high in 2000, being at US$4,551 more than double that of China and higher than in the Philippines, but fell sharply over 2000-06. This fall reflected in part lower petroleum output, as the White Tiger oil field became depleted, but productivity fell in the two other main component industries, construction and electricity, gas and water supply.

This analysis brings out two clear facts. The first is the low level of labour productivity in all major industry groups in Vietnam, with the partial exception of non-manufacturing industry, relative to the ASEAN-4 and China. The second is, with the exception of agriculture, the low rates of productivity growth in all major industry groups in Vietnam. Indeed, for seventeen industry groups at the two-digit level real value-added per worker fell in nine of them over 2000-06. Thus, outside agriculture, the period since 2000 shows a pattern of both low productivity levels relative to comparable countries, and also low or negative productivity growth.

This pattern of growth is brought out clearly in the upper panel of Table S.2, with the economy simply divided into agriculture and all other industries. Real value-added in agriculture over 2000-06 rose by 3.3 per cent per annum on falling employment, so that productivity rose by 4.1 per cent. Value-added in all other industries rose by 8.6 per cent annually, but it was fuelled by employment growth of 6.8 per cent per annum, so that productivity rose by only 1.7 per cent. Thus, over this period, Vietnam has experienced a classic case of extensive rather than intensive growth, with population growth and a shift out of agriculture facilitating rapid growth in overall

GDP (and even in overall productivity growth, given compositional shifts) without any significant change in the low levels of productivity prevailing in most industries. This low quality pattern of growth does not provide the foundation for the transition to much higher living standards to which Vietnam aspires.

It is beyond the scope of this thesis to examine in detail the reasons for this extensive pattern of growth, but one relevant fact is shown in the lower panel of Table S.2. This shows that the foreign investment sector has been growing rapidly per annum over 2000-06, both in terms of value-added (10.6 per cent) and especially employment (23.6 per cent), but with a sharp decline in productivity (–10.5 per cent). The foreign investment sector accounted for one in six of the increase in employment in Vietnam over 2000-06, but labour productivity in the sector fell by 50 per cent over this time. Such a sharp change must imply that the foreign sector is shifting its investment patterns in Vietnam towards labour-intensive, low-cost industries, and is not investing substantially in higher productivity industries.

Table S.2: Vietnam's Growth Profile by Major Sectors, 2000-06

	Real value added	Employment	Value added per employee
	(% per annum)		
By industry			
Agriculture	3.3	-0.8	4.1
All other industries	8.6	6.8	1.7
Total	7.5	2.4	5.1
By Ownership			
State owned	7.2	2.0	5.1
Non-state	7.2	2.0	5.1
Foreign investment sector	10.6	23.6	-10.5
Total	7.5	2.4	5.1

Source: This table is extracted from Table 8.9, page 254.

In Chapter Five two apparently contradictory competitiveness trends were noted: rising revealed competitiveness was shown by the constant market share analysis, while the WEO survey data suggested that Vietnam's structural and institutional competitiveness was low and declining. Here we see a possible explanation for these trends, for Vietnam may be capturing a growing share of world markets for labour

intensive goods, without reforming its structures and institutions and without building effective capacity in higher value-added, higher productivity industries.

In brief, the key findings of Chapter Three show that Vietnam's growth has been export-led, as has been that of the second-tier NICs of Malaysia, the Philippines and Thailand. But neither the characteristics of Vietnam's export structure (Chapter Four), the internal supply-oriented competitiveness effect of the constant market share analysis (Chapter Five), nor the export similarity results (Chapter Six) reflect those of these NICs. They specialised in the high value-added industries of medium-high and high-technology intensity (Chapter Four) that have attracted an increasing share of world trade. In the three respects studied Vietnam's export structure and characteristics are more analogous to those of Indonesia.

In conclusion, this chapter clearly shows that the quality of Vietnam's growth is low and declining from the onset of this century. All these findings from this thesis offer as a warning for its future economic development. Unless Vietnam propels further drastic reforms in many aspects, its recent success will not be sustained into future rapid growth and development. Consequently, the prospect of utilising the untapped potential in manufacturing exports as discussed in Chapter Seven will be pushed further away, and the target to become a newly industrialising country by 2020 as discussed in Chapter Six would not be achieved.

In other words, in the long run Vietnam would only sustain a high economic growth as in the past two decades, if further policy reforms are carried out to boost competitiveness in both natural resource-based and low-tech industries, and medium-high-tech and high-tech industries. Only in this case, Vietnam will be able to considerably narrow the development gap and speed up the catch-up process with the ASEAN-4 and other advanced countries in the world, as well as to gain the NIC status by the year 2020.

Recommendation of policy reforms for Doi-Moi II has been suggested in the conclusion of this chapter.

Part I: Vietnam's Export-led Growth or Growth-led Export?

Chapter One

INTRODUCTION

1.1 Brief Overview of Vietnam's History from 1945

During World War II, Japanese forces occupied Vietnam after the withdrawal of the French troop. Vietnamese nationalists and revolutionaries stood together with the West in fighting against the Japanese occupation. World War II ended in 1945 with Japanese surrender in Asia, and the Viet Minh, a movement consisting of the majority of communist - dominated nationalist, stepped into the power vacuum and proclaimed independence for Vietnam on December 2nd 1945 establishing the Democratic Republic of Vietnam. The return of the French troop in an attempt to reassert their colonial authority in Vietnam ultimately failed after their startling defeat at Dien Bien Phu in May 1954, ending the nine-year First Indochina War from 1946. The French once again had to withdraw from Vietnam after the signing of the 1954 Geneva Accords, which resulted in Vietnam temporarily divided into the North and the South at the 17th parallel. While the North (Democratic Republic of Vietnam) was ruled by the Vietnamese communists and supported by the Soviet bloc and the Chinese; the South (Republic of Vietnam) was backed by the American and its allies.

As civil war between the North (communist) and the South (nationalist) escalated, American troops became directly involved in the war in the early 1960s. The US army contingent in South Vietnam reached over half a million soldiers in 1968. However, American people and the Democrat Opposition did not support the involvement of US

troop in the Vietnam War. Therefore, the US government finally had to sign in 1973 a peace agreement with both sides in Paris to withdraw its troop from South Vietnam. Military aid to the South was reduced and ultimately cut off in early 1975, while the North continued to receive abundant aid from both the Soviet bloc and the Chinese. Consequently, the 'fall of Saigon' inevitably transpired on 30 April 1975 when the North carried out a comprehensive invasion of the South in the spring of 1975, ending a 21-year long civil war. The two regions of North and South Vietnam were formally united under a new name, the 'Socialist Republic of Vietnam' declared in 1976, and Vietnam subsequently became a member of the United Nations the following year.

In South Vietnam, right after reunification in 1975, millions of tonnes of textbooks, magazines, materials etc. published by the former South government were collected and destroyed; hundreds of thousands of former government officers, officials and intellectuals were sent to 're-education camps' in the middle of the jungle for penal servitude; while in the ensuing years of harsh rule, millions of people were driven to the 'new economic zones' in the rural or waste land, including many with business management skills that were needed to rebuild a war-torn economy after the war. On the other hand, millions of refugees fled the country by land and sea (the 'Vietnamese Boat People') until all the refugee camps in Southeast Asian countries such as Hong Kong, Indonesia, Malaysia, the Philippines and Thailand were closed in 1989 following the decision of the United Nations. According to Murray (1977: 18):

> By the time the country was forcibly reunited with the entry of the North Vietnamese army into Saigon on 30 April 1975, Vietnam was devastated. An estimated 14 million tonnes of bombs and shells had torn apart the land (20 million bomb craters in the south alone); much of the foliage had been stripped away by napalm and chemical defoliants, with the threat of long-term genetic damage caused by the latter. There were one million military war dead and another 1.5 million civilian dead. Sixty per cent of southern villages were destroyed; in the north every major town and provincial capital, along with main roads, railway lines, bridges, ports and industrial facilities had been repeatedly bombed. Fifteen million people were rendered homeless throughout the country.

Yet the end of the Vietnam War was not a 'real' ending; a Third Indochinese War[8] (from 1946) occurred three years later in 1978 when Vietnam, after a series of provoking border confrontations, invaded Cambodia with the purpose of removing the Pol-Pot regime and installing a friendly Hun-Sen government in Phnom Penh. This invasion into Cambodia, a regime backing by China, was condemned far and wide by the international community, and also led to the Chinese launching a lightning punitive attack on Vietnam's northern border in 1979. During this time until the withdrawal of the Vietnamese troop from Cambodia in 1989, Vietnam underwent a difficult period of international isolation. The only aid that Vietnam received over this time was from the Soviet Union and its communist allies.

However, while Vietnam's economy nearly collapsed in the mid 1980s with famine conditions in some areas, the declining aid from the Soviet and the Council for Mutual Economic Assistance (CMEA) forced Vietnam to make sweeping changes in its economic direction.

As Marr (1991: 17) notes that Vietnam went through long-awaited changes of leadership in the mid 1980s due either to death or retirement. These old hardliners had dominated the ideological agenda since the 1930s, run the North since 1954, and the entire country from 1975. This transaction made it easier for a slightly younger generation of leaders to announce reforms once again, beginning at the Sixth Party Congress in December 1986. In addition, Gorbachev pushed the Soviet Communist Party down a reformist path reducing the chances of opposition from orthodox members of the Vietnam Communist Party (VCP).

It is worth to note that after Vietnam's international isolation ended following the conclusion of the Cambodian conflict, Vietnam succeeded not only in re-establishing the relationships with member countries of the Association of Southeast Asian Nations (ASEAN) but also normalising diplomatic and economic relations with China in 1991, with Japan in 1993 and with the United States and Europe in 1995. In July 1995, Vietnam also became the seventh member of the ASEAN, joining Brunei,

[8] The Second Indochinese War was the civil war between the North and the South of Vietnam.

Indonesia, Malaysia, the Philippines, Singapore and Thailand to form an economic bloc with more than 400 million people.[9]

Vietnam also has become a member of the following international organisations: ASEAN Free Trade Area (AFTA), Asia-Pacific Economic Cooperation (APEC), ASEAN-Europe Meeting (ASEM), and the World Trade Organisation (WTO) where Vietnam recently became the 150th member in January 2007. It also has a bilateral trade agreement with the United States in December 2001.

Historically, Vietnam's tumultuous history is fairly common for the region. Almost every country in the neighbourhood has had fratricidal wars since 1945 such as Burma, China, Indonesia, Korea and Malaysia. Each reached statehood under a nationalist banner: anti-colonial, anti-Japanese, pro-Communist or a combination of these. All were poor until mid 20th Century and have become far wealthier. The difference with Vietnam is that it took so much longer (Murray, 1997: 19).

Indeed, it took Vietnam a thousand years under Chinese domination, a hundred years to claim for independence from the French, a couple of years fighting with the Japanese to regain its independence, and then a twenty-one year long civil war between the North and the South. How could a country go through such situations and survive without being destroyed, and finally maintaining its sovereignty and territory intact?

[9] Today the Association of Southeast Asian Nations consists of 10 countries which are Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Singapore, the Philippines, Thailand and Vietnam with a total population of more than 560 million.

1.2 Brief Overview of Vietnam's Economy from its reunification in 1975

After reunification in 1975, the government of the Socialist Republic of Vietnam extended its Soviet-style command economy to the formerly capitalist South Vietnam. It focused on the promotion of heavy industrialisation at the expense of agriculture, services and light industry. In fact, the profit tax for domestic firms favours heavy industry with 25 per cent, while that of light industry is taxed at 35 per cent and service industry at 45 per cent (Ebashi, 1997). The central government allocated resources and set quantities for the state-owned enterprises and cooperatives to achieve. However, the prices of production inputs and basic consumer goods were set unnaturally low leading to chronically misallocated resources.

During the first five years after reunification, the government accomplished its policies in nationalising businesses and private industries, collectivising household agriculture and monopolising foreign trade. However, these policies were unsuccessful in the South due mainly to farmer non-cooperation. In addition, the heavy costs of the war with Cambodia, a 'military lesson' learnt from the Chinese reprisals in northern borders, and the trade and investment embargoes from the West, encumbered Vietnam's economic development. In 1979, the government further intensified its implementation of central planning and eradication of private industries and businesses in the south. This led to a disastrous collapse of Vietnam's economy in which per capita income drastically dropped to such a low level that Vietnam was regarded as one of the poorest countries in the world. A summary of comments from Mr. Gareth Evans (1991: 4-5), a former Australian Minister for Foreign Affairs follows below.

- First, even although South Vietnam was the recipient of enormous quantities of American investment until 1975, Vietnam has been at war since 1940, albeit with lulls in the late 1940s and 1950s. Indochina as a whole is probably a generation behind most ASEAN countries in developmental terms. The per capita GNP in Vietnam is of the order of US$175 compared, for example, with Thailand's per capita GNP of US$1,190. Thus, relative to most of its neighbours, Vietnam has a very long way to go.

- Moreover, in the North since 1954 and in the whole country since 1975, Vietnam has suffered from the inefficiencies inherent in a centralised system based on high subsidisation and inefficient allocation of limited resources. The Northern post-war leadership was largely military personnel who had risen to the top of the system through their capacity to wage a war rather than their experience in governing a peace time economy, let alone how to integrate the two widely different economic systems of the North and the South. That problem of integration was exacerbated by the fact that many of the skilled economic managers in the South left or were detained in 1975. Moreover, there was a frustrating incompatibility of plant and equipment, with one half of the country trained and supplied by the Soviet Union and China, and the other half by the United States.
- The Vietnamese economy has had scant opportunities offered to it by the West or by its neighbours since 1975. The application of the United States Trading with the Enemy Act to Vietnam effectively amounted to a US commercial blockade of Vietnam. The US was also instrumental in blocking loans to Vietnam by the international financial institutions such as the World Bank and the Asian Development Bank. On the other hand, because of Vietnam's intervention in Cambodia, most Western countries and Japan did not have development assistance programs with Vietnam. Apart from these difficulties, Vietnam suffered all the problems inherent in a command economy seeking to trade effectively with Western free enterprise economies, and has been heavily reliant on Council for Mutual Economic Assistance (CMEA) trading partners.

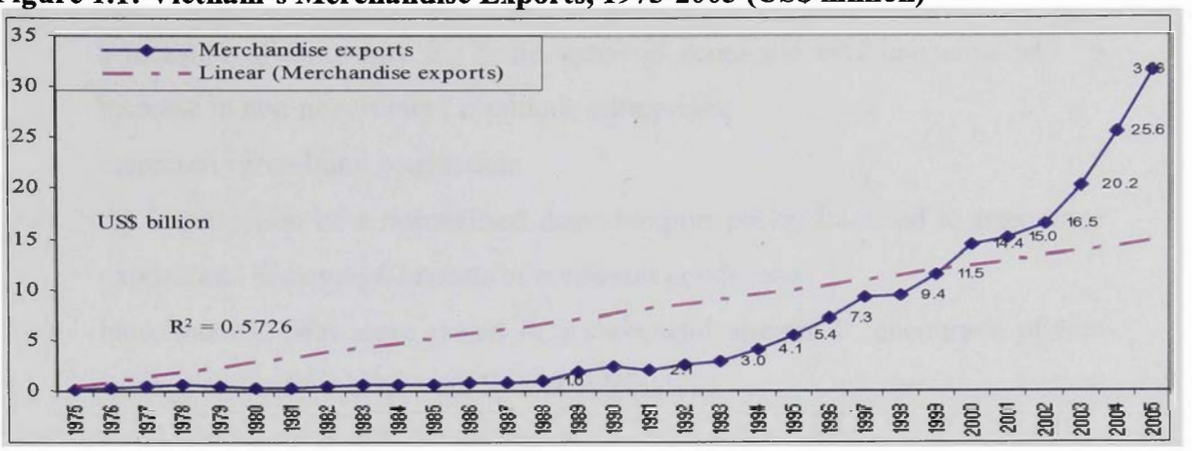
In general, Vietnam's economy, shattered from thirty years of war, was further undermined by the catastrophic imposition of Soviet-style collectivist economic policies. The post-war economy from 1976 to 1980 was stagnant. Industrial production grew an average of 0.6 per cent a year; agricultural production gained 1.9 per cent per annum. At the same time, the population has grown by nearly one million a year (Murray, 1997). Lastly, as mentioned in the previous section, from the mid 1980s Vietnam received less aid from the Soviet Union and CMEA countries, and the fall of the Eastern European communist bloc in 1989 resulted in a reduction of the number of Vietnamese workers in those countries, exacerbating problems in Vietnam by increasing unemployment and reducing remittances.

North Vietnam's economic model of the 1950s extended to South Vietnam from 1975 showing the following characteristics as noted by Murray (1997: 20-1):

- The state determined all important economic activities of the entire country through a system of production plans and goods distribution; there were also strict regulations on pricing and interest rates.
- The state and the collectives constituted the foundation of the economy, the collectives being heavily subsidised in activities such as investment and credit loans quickly developed to become a sizeable part of the national economy.
- Large-scale private enterprises were not encouraged to expand further, but were singled out to be finally incorporated into either state or collective units.
- The market mechanism operated only in small businesses and the household economy. Many capital goods used for production were not allowed to be bought or sold in the market but were allocated by the state's planned distribution system.
- The finances of the state were not separated from that of state-owned enterprises. The state undertook to compensate for losses incurred by these enterprises through subsidies, and when they managed to chalk up a profit, this was returned to the state budget. All productive activities were subsidised by the state through its provision of raw materials and other inputs of production, machinery and equipment imported with aid funds and credit loans, and sold at low prices to the state-owned enterprises. For this reason, the budget deficits and foreign debt increased along with any increase in output.
- The state monopolised foreign trade. Due to historical circumstances, this trade was mainly with the Soviet Union and Eastern Europe through bilateral treaties. Foreign trade companies under state control would implement these treaties, and the profit-and-lost account of foreign trade was entirely taken care of by the state.

Unquestionably, the results of those policies can be clearly seen in Figure 1.1 showing Vietnamese merchandise exports for twelve consecutive years after its reunification in 1975 were almost nothing at all, never exceeding US$1 billion.

Figure 1.1: Vietnam's Merchandise Exports, 1975-2005 (US$ million)



Source: World Bank database.

Almost collapsed in the mid 1980s, the Vietnamese economy was forced to make radical changes to survive and improve its economic development. The Sixth Party Congress in December 1986 decided that Vietnam, after some minor ineffective reforms in 1979, must go further through its adoption of the economic reform program known as Doi-Moi (renovation), like Perestroika in the Soviet Union under the Gorbachev government. Doi-Moi was designed to remedy the inefficiencies of the State industrial sector, to reorganise the development of the non-state agricultural sector and to liberalise an economy rapidly responding to market forces (Evans, 1991). Also, according Murray (1997: 24-5), its key objectives were:

- decentralisation of state economic management, which allowed state industries some local autonomy in relation to production, distribution and financing;
- replacement of administrative measures by economic ones, including a market orientated monetary policy to control inflation;
- adoption of an outward-orientated policy in external economic relations, exchange rates and interest rates were allowed to float in response to market forces and conditions, free gold import was also allowed;
- agricultural policies that allowed for long term land use rights and greater freedom to buy inputs and market products rather than pre-set contracts;
- reliance on the private sector as an engine of economic growth; and
- in trade, allowing selected state-owned and private businesses deal directly with foreign markets for both imports and exports in most products.

Consequently, substantial results from the Doi-Moi initiatives, as stated by Evans (1991: 6), cover the following:

- the introduction of a Foreign Investment Law in December 1987;
- a measure of autonomy for some state-run economic establishments and an increase in non-government economic enterprises;
- increased agricultural production;
- the introduction of a rationalised import-export policy intended to encourage exports and discourage imports of consumer goods; and
- bank interest rates were raised in a successful attempt to encourage private savings and reduce bank cash flow problems.

Of course, the new reform program Doi-Moi needed some time to be implemented nationwide before any obvious effects would be seen as stated by East Asia Analytical Unit (EAAU, 1997: 46): 'Major process of macroeconomics stabilisation and other economic reforms were not introduced until 1989'.

There were two export booms in Vietnam since the country's reunification in 1975 (refer to Figure 1.1 above). The first one was in 1989 after the implementation of Doi-Moi, and the second one in 2002 after Vietnam and the US became the signatories to a Bilateral Trade Agreement in December 2001. The consequence is evident in that Vietnam's merchandise exports growth rate significantly increased to 87 per cent in 1989. For the first ten years after Doi-Moi (1986-1996), the annual average growth rate of Vietnam's merchandise exports was, at 25 per cent, higher than that of the countries of ASEAN-4 at 12 per cent, 19 per cent, 15.6 per cent and 20 per cent respectively. The second decade from 1996-2006 also witnessed a widening disparity in the growth rate of merchandise exports between Vietnam and the ASEAN-4. While Vietnam's average growth rate still remained in two digits at 18.5 per cent per annum, those of the ASEAN-4 countries dropped to only one digit rates, at approximately 7.5 per cent for Indonesia and Malaysia and nearly 9 per cent for the Philippines and Thailand.

In general, over the twenty-year period after Doi-Moi (1986-2006), while Vietnam's average merchandise exports growth rate recorded at 22 per cent, this growth rate for the ASEAN-4 was as follows: 10 per cent , 13 per cent, 12 per cent, and 14 per cent respectively.

Table 1.1: Vietnam's and ASEAN-4's Growth Rate of GDP and Merchandise Exports, Selected Periods (%)

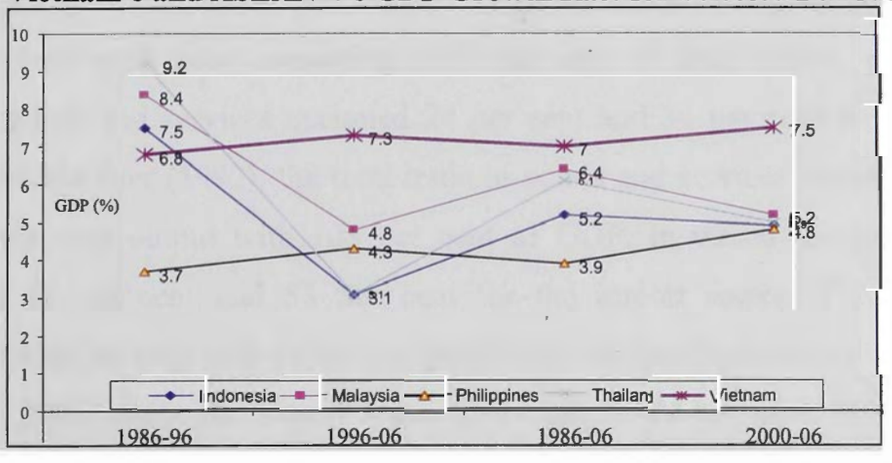
	Indonesia		Malaysia		Philippines		Thailand		Vietnam	
	GDP	Exports	GDP	Exports	GDP	Exports	GDP	Exports	GDP	Exports
1986-1996	7.5	12	8.4	19	3.7	16	9.2	20	6.8	25
1996-2006	3.1	7.6	4.8	7.4	4.3	8.7	3.1	9	7.3	18.5
1986-2006	5.2	10	6.4	13	3.9	12	6.1	14	7.0	22
2000-2006	4.9	8	5.2	8.5	4.8	3	5.0	11	7.5	18

Source: World Bank database.

With respect to GDP growth over the same period, Vietnam also reported the highest average growth rate of 7 per cent, followed by Malaysia with 6.4 per cent, 6.1 per cent for Thailand, and then Indonesia and the Philippines with 5.2 and 3.9 per cent respectively.

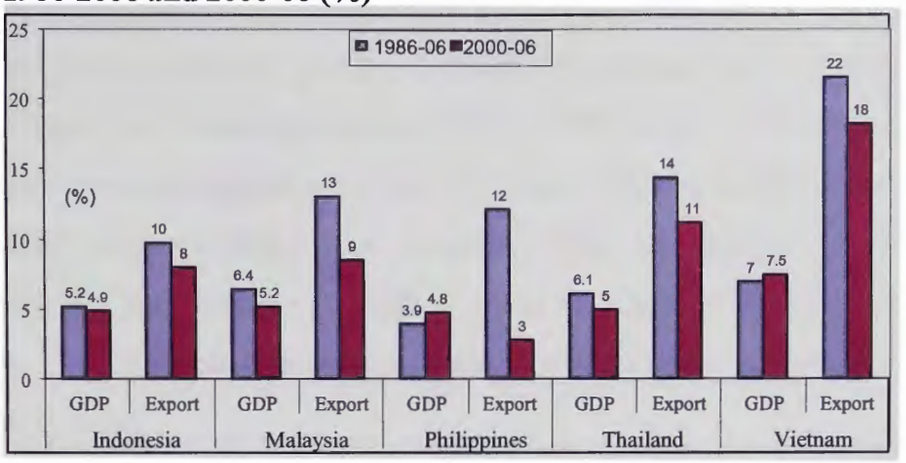
In the second decade since Doi-Moi (1996-2006), a period which covers the two inert events in the regional as well as global economy such as the 1997 Asian financial crisis and US economic stagnancy in 2001, Vietnam's economy still recorded a highest average GDP growth rate of 7.3 per cent, 3 percentage points higher than the Philippines; while Thailand's GDP considerably dropped by 6.1 percentage points from 9.2 to 3.1 per cent. Meanwhile, Malaysia declined nearly a half by 3.6 percentage points, and Indonesia output shrank by 4.4 percentage points. While Figure 1.2 presents the average GDP growth rates for Vietnam and the ASEAN-4 over the periods 1986-96, 1996-2006, 1986-2006 and 2000-06, Figure 1.3 shows their average GDP and merchandise exports growths for two periods: 1986-2006 and 2000-06.

Figure 1.2: Vietnam's and ASEAN-4's GDP Growth Rate for Selected Periods (%)



Source: World Bank database.

Figure 1.3: Vietnam's and ASEAN-4's GDP and Merchandise Exports Growth, 1986-2006 and 2000-06 (%)



Source: World Bank database.

Figure 1.4: Vietnam's Exports, Imports, Total Trade and Trade Balance in Goods and Services as Percentage of GDP, 1986-2007 (%)

Source: World Bank database.

Now let us look at the Vietnamese economy as a whole, which combines the exports and imports of goods and services as a ratio of the country's total output (GDP). Figure 1.4 gives us a rough idea about the importance of trade to Vietnam's economic growth after Doi-Moi. Exports and imports of goods and services started to take off from 1989 with total trade amounting to 58 per cent of total output, in which the exports of goods and services occupied 24 per cent and 34 per cent for the import sector. A decade later (1999), the total trade in goods and services started to exceed the country's total output with 103 per cent of GDP, in which the export sector contributed 50 per cent and 53 per cent for the import sector. This increasing momentum kept moving with exports of goods and services increasing to 76 per cent of GDP in 2007, while the import sector increased to 84 per cent of total output, giving a total trade in goods and services of 160 per cent of GDP.

1.3 Research Objectives

While Table 1.2 shows that the positive correlation between Vietnam's log real GDP and log real exports of goods and services for the 1989-2006[10] period was very strong with 99.4 per cent and significant at the 0.05 level; the logarithm linear regression between these two variables also explains (by its adjusted coefficient of determination, $\overline{R}^2$) their relation strength that was very high at 98.7 per cent over the same period. The log linear regression of these two important economic indicators can be written as follows:

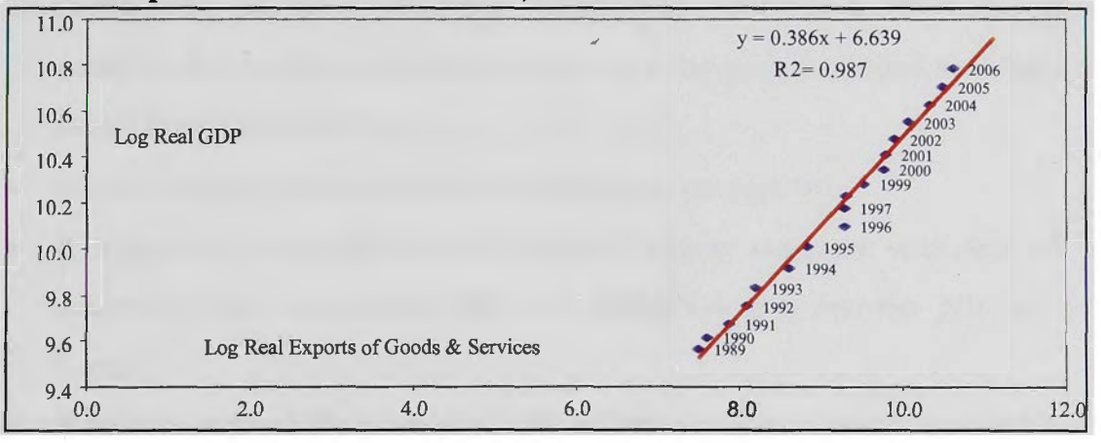
Log Real GDP = 6.639 + 0.386 Log Real Exports of Goods and Services.

Table1.2: Vietnam's Correlations between Real GDP and Real Exports of Goods and Services, 1989-2006

		LRGDP	LREXP
Log Real GDP	Pearson Correlation	1.000	0.994*
	Sig. (1-tailed)	.	.000
	N	18	18
Log Real Exports of Goods and Services	Pearson Correlation	0.994*	1.000
	Sig. (1-tailed)	.000	.
	N	18	18

Note: * Correlation is significant at the 0.05 level (1-tailed).

Figure 1.5: Vietnam's Linear Regression between Log Real GDP and Log Real Exports of Goods and Services, 1989-2006



Source: Author's calculation based on World Bank database.

Therefore, the principal aims of this thesis are to explore, after the implementation of Doi-Moi, the following research questions:

[10] The data for exports of goods and services at constant prices are available from 1989 only.

- What has been the role of exports in Vietnam's economic growth?
- What are the main characteristics of Vietnam's exports in terms of comparative advantage, degree of specialisation, commodity and technology composition and so on?
- What were the main sources of exports growth?
- How is Vietnam's export structure compared to that of the ASEAN-4, and its future development path?
- What can be said about Vietnam's long-term export potential, and about the quality of the economic growth that Vietnam has achieved over this period?

1.4 Research Contributions

This thesis makes the following contributions:

- It provides some useful insights in Vietnam's economy and would assist the Vietnamese and ASEAN-4's policymakers in forming appropriate trade and industrial policies to sustain high economic growth.
- It determines the strengths (comparative advantage) and weaknesses (comparative disadvantage) of export industries in the national economy, and the export industries that Vietnam has been competing with the ASEAN-4.
- It finds out whether Vietnam's exports were specialised or diversified, and whether its changing export structure over the period studied was beneficial for its long-term growth.
- It verifies what factors driving or retarding export growth.
- It measures the similarity of Vietnam's export structure with that of each country of the second-tier NICs of ASEAN-4 and first-tier NIC of South Korea.
- It examines the shifting patterns of Vietnam's exports and of the ASEAN-4.
- It evaluates the feasibility of the target that Vietnam would become a newly industrialising country by the year 2020 as declared by the Sixth Party Congress in December 1986, and the conditions of productivity growth rate for achieving that.

- It predicts Vietnam's development path by looking at its future economic structure in 2020.
- It explores the untapped potential of Vietnam's manufacturing exports based on human and land resources.
- It provides an insight into the quality of Vietnam's high growth and whether this growth is extensive or intensive. It also appraises whether Vietnam's high growth is sustainable in the long run.
- It probably is the first research to study the causality between economic (output) growth and the growth of exports.
- It contributes to the long-standing controversial literature among development economists and scholars of the export-led growth hypothesis.

1.5 Methodologies, Data and Limitations

1.5.1 Methodologies and Data

This thesis does not apply a common standard structure as many other theses, especially like the ones in natural science, in setting up hypothesis (hypotheses) and a separate chapter for methodology or construction of model(s) to test one or more than one hypothesis. There is similarity between hypotheses and research questions since the former can be transformed to the latter and vice versa. This thesis will not follow that way (in setting up hypotheses and building a model in a separate chapter) but bring up research questions in each key chapter. Consequently, there are various methodologies used to achieve the aims of this thesis. Each chapter applies a different methodology depending on the issues and purposes it addresses. Briefly, these methodologies can be named as follows.

- The unit root test and cointegration techniques are used to determine the stationarity and long-run relationship between the real exports of goods and services and real GDP. Then the pair-wise Granger causality and the error correction model (ECM) are applied next to discover the long run and short run causal relationship between these two variables. Finally, the impulse response function (IRF) in vector auto-regressive (VAR) model is utilised as a supplementary measure in verifying the results of these two vectors' causality;

should occur any contradictory findings arising from the first two methods (Chapter Three). Data used in this chapter are exports of goods and services and GDP at constant prices (base year 2000) from 1970 to 2006 for the ASEAN-4; and from 1989 to 2006 for Vietnam.

- Balassa's revealed comparative advantage index and non-parametric techniques are used in Chapter Four, and the disaggregated data at three-digit level (revision 3) of the Standard International Trade Classification (SITC) used in this chapter are from 1997 to 2003. It is noted that Vietnam's disaggregated data at this level are only available for this period, though the ASEAN-4 data are available further forward and backward.
- The constant market share (CMS) model is applied in Chapter Five to decompose the growth of exports into four different effects: (i) the world trade demand effect; (ii) the market distribution effect; (iii) the commodity composition effect; and (iv) the competitiveness effect. Data used are from 1997 to 2006.
- The export similarity index and non-parametric techniques are utilised in Chapter Six; and the data are mainly from 1997 to 2003; however in some sections they are extended from 1980 to 2005.
- The Heckscher-Ohlin theorem is applied with Mayer and Wood's model to predict the untapped manufacturing export potential by using the ratio of skill to labour, ratio of land to labour, and total adult population. In addition, labour productivity index is calculated simply by the ratio between output (value-added) index and labour index. Data are not available for making a specific regression equation for Vietnam; that is why the Mayer and Wood model is used instead. Apart from this, data are not a problem for the calculation task as they are needed for some specific years only.

All the data used in this thesis are obtained from the databases and resources of the following organisations:

- Asian Development Bank;
- International Monetary Fund;
- United Nations;

- Vietnam General Statistics Office.
- World Bank; and
- World Trade Organisation;

Detailed sources of the data extracted will be mentioned in each chapter of the thesis.

1.5.2 Limitations

With the exception of the ASEAN-4 countries, Vietnam's trade data, especially at disaggregated level, are only available from 1997 to 2003. Such a short time-series period certainly causes some limitations in nonparametric analytical task, and thus results drawn from that might be undecided and not very clear as in the case of specialisation versus diversification of Vietnam's exports structure presented in Chapter Four.[11] However, where possible as mentioned above, the analysis extends the time series up to 2008 and as far back as 1986, the point in time when Vietnam implemented its Doi-Moi policy or even further to 1975 as in this chapter. The disaggregated trade data of 247 export product categories extracted from the United Nations Comtrade database complies with the Standard International Trade Classification (SITC) in version 3.

From time to time, the term 'Vietnam and the ASEAN-4' is interchangeably used with the term 'the ASEAN-5' throughout this thesis.

[11] However, the analysis of each country's top twenty exports based on disaggregated trade data at the 3-digit SITC level (Rev. 3) as in Chapter Four is useful to resolve this problem.

1.6 Outline of the Thesis

This thesis is interested in exploring the role of trade (export) in Vietnam's economic growth. In other words, this thesis attempts to unearth whether or not trade has been a growth engine, and whether or not the export-led growth hypothesis is supported in Vietnam since its implementation of Doi-Moi policy in 1986. The determination of causality between exports growth and output growth is very important, as it would help the policymakers to develop appropriate policies and strategies to sustain high economic growth in the long run. This thesis consists of three parts with eight chapters, and the outline is organised as follows.

> Part I: 'Vietnam's Export-led Growth or Growth-led Export' consists of Chapter One, Chapter Two and Chapter Three.
> Part II: 'Characteristics of Vietnam's Merchandise Exports' contains Chapter Four, Chapter Five and Chapter Six.
> Part III: 'Vietnam's Export Potential and Quality of Growth' includes Chapter Seven and Chapter Eight.

Chapter One: Introduction

This chapter is an introduction to the thesis. It briefly presents an overview of Vietnamese history from the end of the World War II and Vietnam's economy after its reunification in 1975. This chapter also sets out the background to the research, the research objectives and methodologies for undertaking such research.

Chapter Two: Theoretical Framework

This chapter reviews the theoretical literature about the relevant international trade theories, which underpin this thesis. These trade-and-growth theories include: (1) the Heckscher-Ohlin factor endowment theory; (2) the export base theory; (3) the endogenous growth theory; (4) Vernon's product cycle theory and Linder's theory of representative demand; (5) the cumulative causation theory; and (6) the new trade theory.

Chapter Three: Trade and Growth: An Empirical Analysis of the ASEAN-5's Causality between Exports and Output Growth

Chapter Three touches on the preliminary objective of the thesis as it investigates the causal relationship between real GDP growth and real exports of goods and services to authenticate whether or not exports have been a growth engine for Vietnam after Doi-Moi. The results from applying the econometric tests to verify this objective are important. To the best of my knowledge, there is no such empirical analysis for Vietnam. This study therefore can throw some light on the role of trade in the sustained economic development in Vietnam as well as in the ASEAN-4 countries.

Chapter Four: ASEAN-5: Comparative Advantage of Merchandise Exports

After the role of export is confirmed as an engine of growth for Vietnam and the ASEAN-4 (with the exception of Indonesia); the purpose of this chapter is to find out the main characteristics of Vietnam's exports (e.g. natural resource-based, low-tech, high-tech manufacturing, specialisation versus diversification etc.), and whether Vietnam's export structure was convergent or divergent to that of the ASEAN-4's second-tier NICs. Also, whether Vietnam's changing export structure was beneficial for its long-term growth?

Chapter Five: ASEAN-5's Sources of Exports Growth

Since Vietnam's export-led growth hypothesis was analogous to that of the second-tier NICs of Malaysia, the Philippines and Thailand; however its exports' characteristics do not reflect those of these NICs but similar to those of Indonesia, a lagger of the ASEAN-4. This chapter, therefore, investigates the sources of its exports growth to identify what really underlay the success of Vietnam's exports over the period studied (1997-2006) by decomposing its exports growth into four separate effects in order to answer the four research questions: (a) what would Vietnam's exports have been if it had expanded at the same rate as world trade? (b) what are the influences of the commodity composition of Vietnam's exports on its export performance? (c) what impacts do trading partner markets have on its merchandise exports? and (d) what portion of Vietnam's exports growth is not related to any of those three factors above? Furthermore, the results of the World Economic Forum's

competitiveness rankings are used to verify the constant market share model's findings in the earlier part.

Chapter Six: Comparative Export Structure and Vietnam's Development Path

The findings of two approaches in Chapter Five that point to different directions raise interesting and surprising issues about the nature of Vietnam's exports structure. There is a common view that one feature of development, especially in the East Asian model, is a progressive structural change in exports from resource and labour intensive products to those, which are more intensive in terms of capital, skill and technology. In Chapter Six, two applications of this principle are used to study the structure of Vietnam's exports in relation to the ASEAN-4, and then the implications of continuing the current pattern of Vietnamese development through to 2020 are assessed.

Chapter Seven: Vietnam's Export Potential?

Chapter Seven is followed to undertake a preliminary investigation of the unexploited potential of Vietnam's manufacturing exports to assess whether it is likely that Vietnam could sustain such a high growth rate through to 2020. The methodology used follows that of Mayer and Wood (2001), and is based on two variables: human-capital resources (average years of education of the labour force) and land resources (square kilometres of land per worker).

Chapter Eight: The Quality of Vietnam's Growth

The results of Chapter Seven have brought to light that Vietnam inherits both abundant natural resources in agriculture, fuels and mining and an educated labour force as well as a large untapped potential in manufactured exports. In the long-run, development is largely about increasing the productivity of the labour force, so this is a useful lens through which to analyse the quality of growth and the likelihood that a given growth path will contribute to effective development. In this chapter labour productivity in Vietnam is analysed for key industry sectors, in the context of trends in the ASEAN-4 and in China, for the period 1990-2006. A more detailed analysis by

industry in Vietnam is also undertaken, but for reasons of data availability the period is restricted to 2000-06.

1.7 Conclusion

This introduction chapter presents the case of Vietnam from a brief synopsis of its history from the end of World War II to an overview of its economy since this country's reunification in 1975. The Doi-Moi policy implemented in 1986 has transformed its centrally planned system to a so-called socialist-oriented market economy, which has shown positive signs of success in the economic development process. This chapter then sets out the research questions, research contributions and methodologies for undertaking this study.

What has been the role of exports in Vietnam's economic growth after Doi-Moi? What are the main characteristics of Vietnam's exports? What were the main sources of its exports growth? How is Vietnam's export structure in relation to that of the ASEAN-4 and its future development path? What can be said about Vietnam's long-term export potential, and about the quality of the economic growth that Vietnam has achieved over this period?

These fascinating major research questions will be answered in this thesis. However before touching on the causal linkage between 'trade and growth', an important starting point of this thesis in Chapter Three, the next Chapter Two will lay down the theoretical framework underpinning this thesis.

Chapter Two

THEORETICAL FRAMEWORK

2.1 Introduction

In the past four decades, the question concerning the role of trade (exports) as an engine of growth for economic development in developing countries, would be derived from the classical economic theories by Adam Smith (1723-90) and David Ricardo (1772-1823) in the eighteenth century. Adam Smith proposes that international trade plays an important role in economic growth by increasing the size of markets, and offering each country the possibility of taking advantage of the increasing returns to scale based on the division of labour and specialisation. David Ricardo focuses more on the differences in production technologies that induce a country to specialise in the production of commodities that it has comparative advantage, and that the increasing returns to scale are not necessary but the constant returns to scale in every production process may be needed. However, both Smith and Ricardo agree on one point that is, with trade, specialisation in the production of a commodity that a country can produce relatively more cheaply than other countries; each country then, with a given amount of resources, can consume more than it could without trade. In other words, the quantity of each commodity that a country produces depends on its factor endowment and its production technology.[12] As long as these two ratios differ, each country has a comparative advantage in the production of one of the commodities.

As most of the chapters in this thesis are empirical analyses based on international trade and economic theories, this chapter is thus set aside for discussing the

[12] As stated by Athukorala (2003:5) that rapid advancements in production technology have enabled the industry to slice up the value chain into finer and portable components. Second, technological innovations in communication and transportation have shrunk the distance that once separated the world's nations, and improved speed, efficiency and economy of coordinating geographically dispersed production process.

theoretical framework underpinned this research. Its purpose is to provide only a brief overview of related background theories and the possible relations between them. These international trade theories include: (1) Heckscher-Ohlin theory; (2) export base theory; (3) product cycle theory and Linder's theory of representative demand; (4) cumulative causation theory; (5) endogenous growth theory; and (6) new trade theory. Each following section, therefore, outlines each of these abovementioned theories.

Specifically, this chapter is organised as follow. Section 2.2 reviews the Heckscher-Ohlin theory, which consists of: (1) factor price equalisation theorem; (2) Stolper-Samuelson theorem; (3) Rybczynski theorem; (4) Heckscher-Ohlin theorem; and (5) the national welfare effects of free trade in the context of Heckscher-Ohlin theory. Section 2.3 follows to discuss the export base theory. While the endogenous growth theory is reviewed in Section 2.4, the product cycle theory and Linder's theory of representative demand is discussed in Section 2.5. Then, a synopsis of the theory of cumulative causation is presented in Section 2.6, followed by the new trade theory in Section 2.7. Finally, Section 2.8 concludes the chapter.

2.2 Heckscher-Ohlin Factor Endowment Theory

The Heckscher-Ohlin theory (named after its original development by two Swedish economists, Eli Heckscher and his student Bertil Ohlin), leading studies of international trade between the 1920s and the early 1980s, states that a country's exports depend on its resources endowment whether it is capital-abundant or labour-abundant. If capital-abundant, it will produce and export the capital-intensive goods relatively more cheaply than the other country. Likewise, a labour-abundant country will produce and export the labour-intensive goods relatively more cheaply than the other.

It is worth to note that the difference between the Ricardian and Heckscher-Ohlin model is the former postulates differences in production technologies between countries, while the latter assumes that production technologies are the same. Also, the Heckscher-Ohlin model assumes there are no differences in the aggregate

preferences between countries. The only difference existing is that different countries have different resource endowments, and this major discrepancy is sufficient to cause a different production possibility frontier in the two countries such that equilibrium price ratios would differ in an autarky.

There are six assumptions usually postulated for the analysis of the Heckscher-Ohlin theory of trade:

- no transportation costs or trade barriers (implying identical commodity prices in every country with free trade);
- perfect competition in both commodity and factor markets;
- all production functions are homogeneous to the first degree (implying constant returns to scale);
- production functions are such that the two commodities always show different factor intensities;
- production functions differ between commodities but are the same in both countries; and
- tastes are the same in both countries (more specifically, both countries have identical homothetic community indifference maps).

Furthermore, there are four major theorems in the Heckscher-Ohlin model: (1) the factor-price equalisation theorem; (2) the Stolper-Samuelson theorem; (3) the Rybczynski theorem; and (4) the Heckscher-Ohlin theorem. While (2) and (3) describe relationships between variables in the model, (1) and (4) present some of the key results of the model.

2.2.1 Factor Price Equalisation Theorem

This theorem assumes that if factors of production are freely mobile among countries, then factor prices would be the same in all countries. The factor price equalisation theorem says that if the prices of the output goods are equalised between countries engaged in free trade, then the price of the input factors will also be equalised between countries. This implies that the wages and rents will converge across the

countries with free trade, or in other words, trade in goods is a perfect substitute for trade in factors.

Let us take an example to clarify this theorem. The opening-up to trade for a labour-abundant country such as Mexico will increase the price of labour-intensive goods, say clothes, and thus lead to an expansion of clothes production. As there is a great demand for clothes in foreign markets, the demand for factors of production increases in the clothes sector. Because clothes are labour-intensive goods, an increasing demand for labour in Mexican's factor market will absorb labour from the capital-intensive industry, say steel, to boost the production of clothes. The expanding clothes industry absorbs relatively more labour than the amount released by the contracting steel industry. The price of labour is bid up, and while its relative price increases, the relative price of capital declines. As a result, the factors of production will become more capital-intensive in both sectors leading to a decline in the marginal productivity of capital and an increase in that of labour in both sectors.

Likewise, in a capital-abundant country like the US for instance, the producers try to produce more of the capital-intensive good, say steel, to supply to a great demand internationally. Since more steel is produced, which means more capital is relatively needed for production, the relative price of capital thus increases and so on. In brief, this theorem postulates that, with free trade, the price of a labour-abundant country will increase and the price of a capital-abundant country will decrease. This factor price equalisation theorem implies that, 'if there were no complete specialisations in any country, with free trade the factor prices will become not only relatively but also absolutely identical in both countries' (see Hong, n.d., Chapter 7).

According to Suranovic (2006), this theorem formed the basis for some arguments often heard in the debates leading up to the approval of the North American Free Trade Agreement (NAFTA) between the US, Canada and Mexico. Opponents of NAFTA feared that free trade with Mexico would lower US wages to the level in Mexico, although a more likely outcome would be a reduction in US wages coupled with an increase in Mexican wages.

Factor price equalisation is hardly seen in the real world as, for example, the cost of the hourly rate in Mexico is much lower than in the US. Reasons may vary for not seeing factor price equalisation including: (1) differences in factor quality; (2) differences in production technology across countries; and (3) more obviously, differences in output prices across countries of the same product. In reality, there is a positive correlation between labour productivity and wages, so if we adjust wages according to labour productivity then factor price equalisation looks like a more realistic result. As such 'a better interpretation of the factor price equalisation theorem applied to real world settings is that free trade should cause a tendency for factor prices to move together if the countries' trade is based on differences in factor endowments' (Suranovic, 2006).

2.2.2 Stolper-Samuelson Theorem

This theorem states that an increase in the price of a good will cause an increase in the price of the factor used intensively in that industry, and a decrease in the price of the other factor.

Making it clear, let us take the example of the US and Mexico as discussed above. We would agree that the US is a capital-abundant and Mexico a labour-abundant country. In the long process of trading between the two countries, the prices of goods would converge to the same in the US as in Mexico. In particular, the relative price of labour-intensive goods in the US should fall and the relative price of capital-intensive goods should rise. This used to be a good reason, based on the Stolper-Samuelson theorem, for the US trade unions to oppose NAFTA, as the trading process between two countries should increase the return to capital owners, but decrease the wage of workers. More specifically, say, steel is a capital-intensive good produced by the US and clothing is a labour-intensive good produced by Mexico. Therefore, the relative price of steel in the US is lower than in Mexico, and vice versa. What happens if the two countries start trading?

- *In the US*: the relative price of steel rises due to trade. This raises the rental rate (gain for capital) because steel is capital-intensive, but lowers the wage rate (loss for labour).

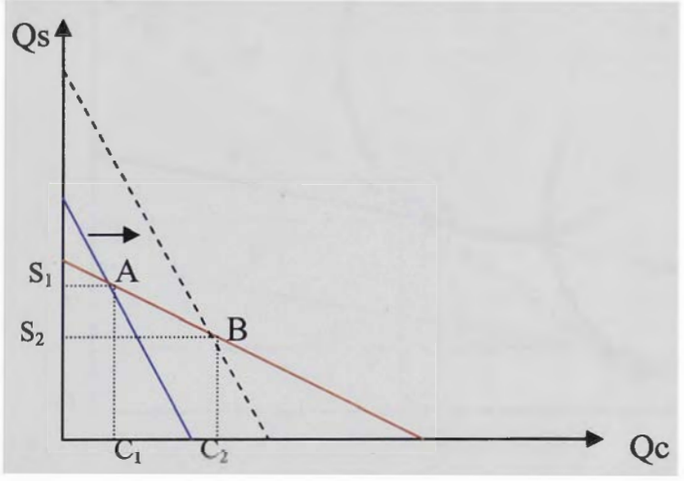
- *In Mexico*: the relative price of steel falls due to trade and the relative price of clothes rises. This raises the wage rate for workers as the manufacture of clothing is labour-intensive, but lowers the rental rate (loss for capital).

2.2.3 Rybczynski Theorem

Like the Stolper-Samuelson theorem, the Rybczynski theorem depicts the relationship between endowments and outputs by assuming a small open economy engaged in free trade. It demonstrates how changes in an endowment affect the output of the goods when full employment is maintained. This theorem states that an increase in the endowment of a factor will increase the output of the industry using it intensively and decrease the output of the other industry.

Using the example above, assuming that steel is capital-intensive and clothing is labour-intensive. If the capital endowment of the US increases, it will produce more steel and fewer clothes.

Figure 2.1: Production Possibility Frontier



In Figure 2.1 above, consider a labour constraint, which is the steeper blue line, and a capital constraint (the flatter red line). Suppose initially that production in the US occurs at point A producing clothes (labour-intensive good) at C_1 and steel (capital-intensive good) at S_1. Now, assume that there is an increase in the labour endowment, which parallel shifts the labour-constraint line to the right and moving point A to B. The production of clothes now increases from C_1 to C_2, and at the same time the production of steel decreases from S_1 to S_2. Likewise, if the capital endowment

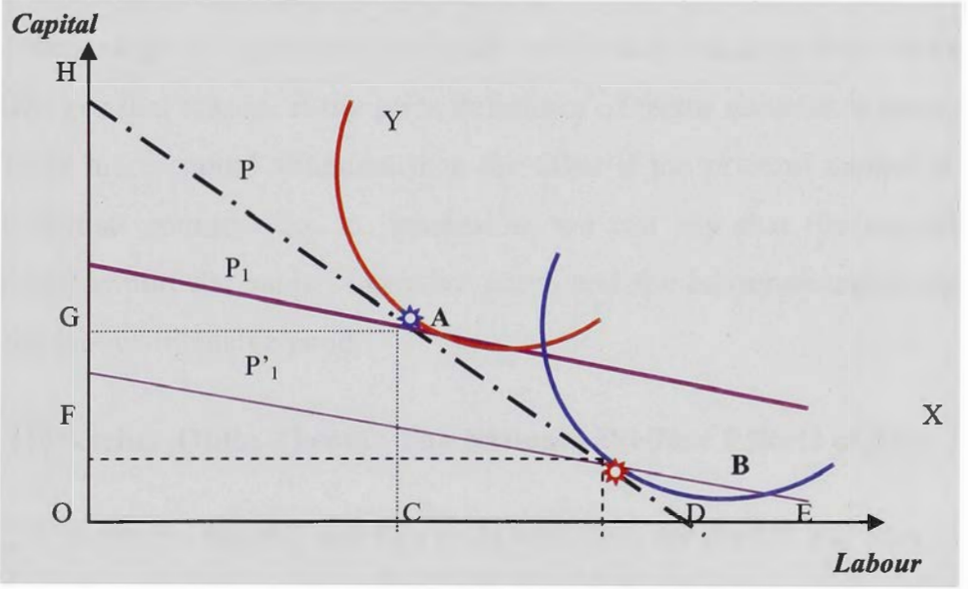
increases will shift the capital constraint line outward to the right, this causes an increase in steel production and a decrease in clothes production.

2.2.4 Heckscher-Ohlin theorem

This theorem states that a capital-abundant country will export a capital-intensive good and a labour-abundant country will export a labour-intensive good.

Consider two countries, the US and Mexico in the example above and recall that the assumptions applied to the Heckscher-Ohlin theory include a similarity in production functions (identical technology) and aggregate preferences across the two countries. The difference in resource endowments between two countries is sufficient to generate different PPFs, such that equilibrium price ratios would be different in autarky.

Figure 2.2: Factor Abundance Defined by Factor Prices



Since the Heckscher-Ohlin theorem assumes identical constant-returns-to-scale production technologies in both countries, the relationship between factor price ratio and commodity price ratio should be examined. Figure 2.2 shows the unit isoquant curve for the labour-intensive good X (clothes) and the capital-intensive good Y (steel). The US is relatively capital abundant and has a factor price ratio represented by the line P, while that of Mexico is represented by the line P_1. One unit of capital-intensive good Y is produced by OG units of capital and OC units of labour. However, capital and labour can be exchanged for each other, therefore OC unis of

labour can be exchanged for GH units of capital, and OG units of capital are worth CE units of labour. Thus, the cost of producing one unit of the capital-intensive good Y in the US, measured in units of capital, is OH; and measured in units of labour is OE. Similarly, the cost of producing one unit of the labour-intensive good X is OE when measured in units of labour, and OH when measured in units of capital.

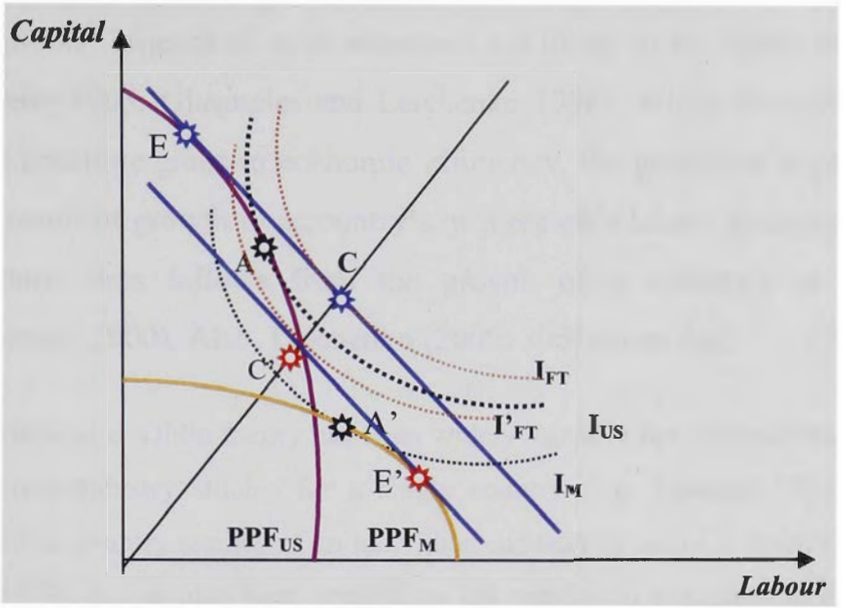
The factor price ratio P_1 of Mexico is tangent to the unit isoquant curve for good Y (steel) at point A, which means capital is relatively more expensive in Mexico than in the US. A parallel shift of P_1 to P'_1 is tangent to the unit isoquant curve for good X (clothes) at point B, certainly below P_1. Therefore, in Mexico, it is relatively more expensive to produce good Y (steel) than X (clothes).

All of the above implies that any difference in autarky prices between the US and Mexico is sufficient to induce profit-seeking firms to trade. The higher price of the capital-intensive good Y (steel) in Mexico will induce firms in the US to export steel to Mexico to take advantage of the higher price. Likewise, the higher price of the labour-intensive good X (clothes) in the US will induce Mexican firms to export cloth to the US. For that reason, if the price definition of factor abundance used, a country is relatively more capital abundant than the other if the price of capital is relatively cheaper in that country. So, in conclusion, we can say that the capital-abundant country will export the capital-intensive good, and the labour-abundant country will export the labour-intensive good.

2.2.5 Heckscher-Ohlin Theory: The National Welfare Effects of Free Trade

Figure 2.3 illustrates autarky and free trade equilibria for the US and Mexico. The US autarky production and consumption is determined at point A, where the aggregate indifference curve I_{US} is tangent to the PPF_{US}. Opening to free trade, US production and consumption are at point E and C respectively. In free trade, the US realises a level of aggregate utility which corresponds to the indifference curve $\mathbf{I_{FT}}$, which moves to the right of the autarky indifference curve I_{US}, therefore US national welfare increases in free trade.

Figure 2.3: National Welfare Effects in Free Trade



Likewise, Mexico's autarky production and consumption are determined at point A', where PPF_M is tangent to I_M. In free trade, Mexico's production is at point E and consumption at point C'; Mexico realises a level of aggregate utility corresponding to the indifference curve I'_{FT}, which shifts to the right of the autarky indifference curve I_M, therefore Mexico's national welfare increases in free trade. This means that both countries will be better off and benefit in free trade with an increase of aggregate welfare for both. However, according to Suranovic (2006, Chapter 60: 10):

> The use of aggregate indifference curves (or preferences) ignores the issue of income distribution. Although it is correct to conclude from the analysis that both countries benefit from free trade, it is not correct to conclude that all individuals in both countries also benefit from free trade. By calculating changes in real income in the Heckscher-Ohlin model it can be shown that some individuals will likely benefit from free trade while others will suffer losses. An increase in aggregate welfare means only that the sum of the gains exceeds the sum of the losses.

In general, the arguments in favour of trade liberalisation are often based on the Heckscher-Ohlin theory. The idea that opening a nation to trade, and thereby allowing its economy to specialise according to its relative endowments is beneficial, was fundamental to the liberal trade position of the US after World War II (Goldstein, 1993). More recently, the notion that free trade provides more benefits to participant countries is supported by advanced countries, or organisations and trade blocs such as

GATT (WTO), EU, AFTA etc.; although several studies suggest that the distributional impacts of such measures are likely to be highly uneven (Conroy and Glasmeier 1993; Glasmeier and Leichenko 1996). While liberalisation of trade may lead to one-time gains in economic efficiency, the growth of exports actually occurs as the result of growth in a country's or a region's labour or capital supplies. Growth of exports thus follows from the growth of a country's or region's economy (Leichenko, 2000). Also, Leichenko (2000: 306) states that:

> Heckscher-Ohlin theory has been widely tested at the international level through cross-industry studies for a single country (e.g. Leontief 1953) and through cross-country studies of an individual industry or set of industries (e.g. Baldwin 1979). It has also been applied to US regions to evaluate the determinants of export production (e.g. Coughlin and Fabel 1988; Erickson and Hayward 1992). The results show that differences in state endowments are significant determinants of state export levels but that these factors explain only a limited portion of the variation in export performance among states. Other factors also thought to influence state export performance include differences in foreign and domestic markets, industry structure and agglomeration economies (Erickson and Hayward 1992).

However, problems with the Heckscher-Ohlin theory appeared in the late 1950s based on Leontief's input-output studies of the US economy. His empirical studies suggest that US exports require a higher proportion of labour to capital than US imports, and thus the US is not capital-abundant compared with the rest of the world as normally supposed. Also, from the early 1960s, there has been a growing volume of world trade with similar factor endowments occurring between advanced countries. Furthermore, much of this trade particularly after 1980 was either intra-industry trade or intra-firm trade, neither of which can be explained by the Heckscher-Ohlin theory (Dicken, 1998).

2.2.5.1 Static Gain from Trade

Static gains from trade are those which accrue from international specialisation according to the doctrine of comparative advantage. As a result of the international division of labour, according to Thirlwall (2006: 521), the increase of world

production is followed by the increase of world welfare. Specialisation on the basis of comparative advantage maximise the production from a given amount of factor resources. The opportunity obtaining foreign products more cheaply thanks to trade increases consumers' welfare, in terms of real resources forgone, than the alternative of import substitution or producing domestically. As Corden (1971) notes, the opening-up of an economy to trade generates static efficiency gains that are very similar to 'once-and-for-all' technical progress in raising the absorption-possibility frontier of a country at the given factor supplies. Furthermore, with a given constant propensity to save, the static efficiency gains will induce the rate of capital accumulation to rise and consequently will raise the growth rate of the economy. This may be described as the 'induced-growth gains' from trade. If investment goods were mostly imported, then these induced growth gains will also include the effect of reduced prices of investment goods. On the other hand, the opening-up to free trade may raise the rate of growth of an economy not only through static-efficiency gains and the associated 'induced-growth gains', but also by directly raising the country's propensity to save. Thirlwall (2006) adds that the gain from trade is the value added between the value of things obtained and the value of things given up. Through the international division of labour, a country is supposed to obtain more than it gives up.[13] If comparative advantage were exactly the same in the two countries there would be, of course, no static gains and the justification for trade would be to reap economies of scale and other dynamic gains.

2.2.5.2 Dynamic Gains from Trade

According to classical trade theory, moving from a closed economy to free trade produces substantial economic gains because trading countries benefit from

[13] As Athukorala (2003: 4) states that the location in developing countries of relatively labour intensive component production and assembly within vertically integrated international industries has been an important feature of the international division of labour since about the late 1960s. The transfer abroad of component assembly operations such as in electronics and garment industries and subsequently spread to many other industries (e.g. electrical appliances, automobile parts, electrical machinery and optical products, musical equipment, watches, and cameras etc.) where the technology of production permits the separation of labour intensive components from other stages of production to minimise the transport costs involved. International product fragmentation allows companies to unbundle stages of production so that each stage can be relocated in countries in which the intensively used inputs are cheap. The nature of factor intensity of the given segments and the relative prices of factors in comparison with their productivity jointly determine which country produces what components.

specialisation and more efficient resource allocation. In general, the impact of trade on production possibilities such as economies of scale, international investment and the transmission of new technologies and skills, etc. leading to higher productivity are dynamic gains from trade. Thirlwall (2006: 521) puts in his words:

> The major dynamic benefit of trade is that export markets widen the total market for a country's producers. If production is subject to increasing returns, the total gains from trade will exceed the static gains from a more efficient allocation of resources. There is also a close connection between increasing returns and the accumulation of capital. For a small country with no trade there is very limited scope for large-scale investment in advanced capital equipment; specialisation is limited by the extent of the market. But if a poor developing country can trade, there is some prospect of industrialisation and of dispensing with traditional methods of production. The larger the market, the easier capital accumulation becomes if there are increasing returns to scale. The smaller country, however, may need substantial protection for a commodity before it can be produced economically and compete in world markets.

2.3 Export Base Theory

We all know that the economic activities of a country are divided into those that produce for the export markets and those for the local (residentiary) markets. The belief that trade is an engine of growth stems from the notion within export base theory that growth of exports provides externality and productivity benefits to regional economies. In its simplest form, export base theory suggests that regional growth in output and employment is a function of exogenous demand for a region's exports, assuming perfect elasticity of input supply and export demand. Growth is generated not only through direct sales of export goods, but also through a Keynesian income multiplier: income growth associated with the growth of a region's exports results in further increases in demand for local goods, which in turn, leads to further growth in regional income (Leichenko, 2000: 304).

Earlier, North (1955: 257) extended the simple version of export base theory by stating the following.

- The success of the export base has been the determining factor in the rate of growth of regions. Therefore, the locational factors that have enabled the staples to develop need to be examined.
- The importance of the export base is a result of its primary role in determining the level of absolute and per capita income in a region, and therefore in determining the amount of residentiary secondary and tertiary activity that will develop. It also has significant influence on the character of subsidiary industry, the distribution of population and pattern of urbanisation, the character of the labour force, the social and political attitudes of the region, and its sensitivity to fluctuations of income and employment.
- In a young region dependence on staples is reinforced by the concerted efforts of the region's residents to reduce processing and transfer costs through technological research, and state and federal government subsidisation of social overhead benefits, as well as the tendency for outside suppliers of capital to reinvest in the existing staple base.
- Some regions, because of locational advantages, have developed an export base of manufactured products, but this is not a necessary stage for the sustained growth of all regions. A great deal of secondary and tertiary industry will result from the success of the export base. This residentiary industry will provide for widening the export base as a region develops.
- The growth of regions has tended to be uneven. A given increase in demand for a region's exports has resulted in a multiple effect on the region, inducing increased investment not only in the export industry but in all other kinds of economic activity as well.
- As a region's income grows, indigenous savings will tend to spill over into new kinds of activities. At first, these activities satisfy local demand, but ultimately some of them will become export industries. This movement is reinforced by the tendency for transfer costs to become less significant. As a result, the export bases of regions tend to become more diversified, and they tend to lose their identity as regions. Ultimately, we may expect more equalisation of per capita income and a wider dispersion of production with long-run factor mobility.

Worth noting is that there was a debate between North and Tiebout regarding the export base theory, which suggests that the applicability of this theory is largely a

function of the scale and scope of a region's economy. Whereas North (1955) states as above, Tiebout (1956: 164) argues that: (1) the concept of export base is merely one aspect of a general theory of short-run regional income determination; in the case of large regions, other variables may play as important a role as exports; (2) the concept of export base may be useful in describing regional income growth, but this need not be considered the same problem as general economic development; (3) as an explanatory factor in regional growth, the idea of the export base should not subsume the key role of residentiary activities in determining factor costs of possible regional exports; and (4) since a region must optimise the use of factors as between exports and residentiary outputs, a decline in export activity may even be accompanied by rising regional income.

Despite these and other criticisms, the theory of export base continues to be widely used for regional development and planning and for analyses of international trade and growth. Although numerous methodological approaches have been developed to define the export base, the most recent of which involve the application of advanced time-series methods (Brown, Coulson and Engle 1992). The idea that exports provide an engine of growth is also frequently applied in studies of the regional and national impacts of foreign export growth (Feder 1983; Kavoussi 1984; Webster, Mathis and Zech 1990).

2.4 Endogenous Growth Theory

Endogenous growth theory (EGT) was developed in the 1980s as a response to criticism of the neoclassical growth models, which assume that a country's long-run growth rate is exogenously determined by a savings rate (the Solow model) or a rate of technical progress. These factors had not been used in the neoclassical models, and come out to be very unrealistic. Leichenko (2000: 309) states that, although growth within the neoclassical model may also occur as a function of increases in human capital, physical capital or population; these types of growth are assumed to have diminishing or constant returns to scale, and thus cannot bring about sustained growth in per capita income. A major prediction of the neoclassical model is that growth rates of countries or regions will converge over time (Barro, 1993). However, studies have

found that a large share of economic growth cannot be explained by technological change and that empirical evidence does not support convergence (Tallman and Wang 1992; Romer 1994). Also, the new empirics of regional convergence in the industrialised world reveal a rate of regional convergence that is much slower than the rate proposed by orthodox neoclassical models (Martin and Sunley, 1998).

Also, according to Martin and Sunley (1998: 208), endogenous growth theory attempts to rectify some of the problems of neoclassical theory by developing models in which long-run growth rates are endogenous to the model, based on certain assumptions about increasing returns, human or physical capital and technology investment. There are two different types of endogenous growth theory, which envisage different sorts of increasing returns: endogenous broad capital models and endogenous innovation models. Endogenous broad capital models can be further separated into two sets: (a) those that simply show capital investment as generating externalities; and (b) those that emphasise human capital and relate technological change to 'learning by doing' and 'knowledge spillovers'. The second type, endogenous innovation growth theory, has been labelled Schumpeterian because it emphasises the returns to technological improvements arising from deliberate and intentional innovation by producers.

The EGT suggests that improvements in productivity can be linked to a faster pace of innovation and extra investment in human capital. Further, it predicts positive externalities and spillover effects from development of a high valued-added knowledge economy, which is able to develop and maintain a competitive advantage in growth industries in the global economy. In summary, the main points of the endogenous growth theory are as follows:

- the rate of technological progress should not be taken as a given in a growth model, appropriate government policies can permanently raise a country's growth rate particularly if they lead to a higher level of competition in markets and a higher rate of innovation;
- there are potential increasing returns from higher levels of capital investment;

- theory emphasises that private investment in R&D is the central source of technical progress;
- protection of property rights and patents can provide the incentive to engage in R&D; and
- investment in human capital (education and training of the workforce) is an essential ingredient of growth.

In emphasising the importance of spillovers associated with new technologies, endogenous growth theory suggests that differential patterns of growth may emerge as the result of specialisation in different types of export goods. While all regions may benefit from growth of exports, regions that specialise in goods with greater potential for spillovers may tend to experience more rapid growth than other regions. Although several tests of endogenous growth theory have been conducted at the regional level, these studies have not addressed the linkages between foreign trade and regional growth (Leichenko 2000: 310).

2.5 Product Cycle Theory and Linder's Theory of Representative Demand

Vernon's theory (1966) of the product cycle is developed from the viewpoint of the US market (developed countries), where the theory puts less emphasis on the factor-proportion theory of comparative advantage and more on the timing of innovation, the effects of scale economies, and the roles of ignorance and uncertainty in influencing trade patterns. Vernon claims that a large gap exists between the knowledge of scientific principles and the application of these principles in the generation of new, marketable products (Hong, Chapter 17: 1).

The product cycle of Vernon encompasses three general stages of product development: (1) *introduction*, where advanced countries developing and exporting a particular product to foreign markets; (2) *standardisation*, where inventing countries lose export market shares to other countries who imitate the innovation; and (3) *maturation*, where the inventing countries become net importers of the product. The core of this theory is the assumption that diffusion of new technology transpires slowly enough to create temporary differences between countries in available

production technology. Leichenko (2000: 306) states that, home market characteristics are particularly important during the first stage of the product cycle, when a new product is introduced into the US market. Production during the first stage is typically characterised by high per unit costs, low price elasticity of demand and monopoly power over the product design. Because the need for flexibility in use of inputs, and the need for rapid communication between producers and consumers as the product are test-marketed, are more important than production costs during this first stage, but producers will also export to other countries with levels of income and demand similar to those of the US.

At the same time, in the developing countries, where the new product is imported and introduced, consumer demand gradually picks up and demand induces domestic production starts. Nevertheless, the inferior quality and high costs of production impede the competition with foreign imports. Hence, imports remain high and a run on the country's foreign exchange may occur.

The next stage (second) of development from Balassa's five-stages of development (also Akamatsu's flying geese theory),[14] according to Dowling and Cheang (2000: 447), is often to substitute foreign imports with domestic products in the hope of correcting the current account deficits, which result from increasing domestic demand. In order for this to happen, it is necessary for the state to implement certain level of tariffs and other import restrictions to protect the domestic industry from foreign competition, as happened in the ASEAN-4 in the 1970s. The advantageous position of having an established and often protected domestic market, coupled with the acquisition of standardised production technology, makes large-scale production possible. Hence, domestic products gradually replace foreign imports as product quality improves and price becomes competitive. This stage corresponds with the standardisation stage (second) in the inventing advanced country (Vernon's theory).

[14] The 'flying geese' development theory was first proposed by K. Akamatsu in the early 1930s. This theory of the general principle of development is similar to that of the 'product cycle' theory, developed by Vernon (1966). The key difference between the two theories is the prospective taken. 'Product cycle' theory takes the prospective of the developed countries. It describes how a new product is invented and developed from its infant stage to exporting stage and finally to its declining stage. On the other hand, the 'flying geese' model takes the prospective of a developing country. It describes how a new product is introduced to the less developed countries via imports (this stage should correspond to the declining stage of the 'product cycle' theory) (Dowling and Cheang, 2000: 446).

Foreign investors will start investing, but in small amounts, into developing countries. This may be because the domestic market is relatively small since the income per capita is still low, or because of an undeveloped or inappropriate commercial and legal framework, inadequate transport and communication facilities, and the lack of an educated workforce.

By the third stage, the growth of domestic demand has slowed down and exports of the product have begun. Production is kept at a high level through additional production for export. Imports diminish in absolute terms. The strong exports enable the country to import capital goods for continued expansion of production. Inward FDI becomes significant as the same industry in the advanced countries has lost its comparative advantage, and has started to relocate to developing countries. This stage in the developing countries corresponds with the maturation stage (third) in the inventing country. In addition, as the economy develops, the commercial and legal framework, as well as transport and communication facilities will be better developed. The workforce will also be better educated.

Back to inventing developed country, 'as demand for the product increases, the process of standardisation (Vernon's second stage) accordingly takes place and the need for flexibility will decline' (Vernon, 1966: 196). Concurrently, some demand for the product will emerge elsewhere. In this stage, the requirement of significant inputs from the local inventing country such as skilled labour, spare parts, industrial materials processed according to exacting specification etc., is still needed in manufacturing processes of maturing products. These are not possible to find in developing countries but would be possible in other developed countries. However, at a later period in the standardisation stage, growth of demand may become slow in the United States and other developed countries, but may increase in developing countries. Consequently, the production may be shifted to developing countries due to cost advantages. The reason is standardised products require significant inputs of labour, which is cheap in developing countries, and may not require extensive external economies and elaborate industrial support facilities. The US and other developed countries may become net importers of standardised products during

Vernon's third stage, and this is also the third stage of Balassa's five-stages (or Akamatsu's flying geese) theory.

As the industry gets into its mature stage (stage four), production slows down in face of increasing costs and intensified competition from late-starting countries. Consequently, exports will increase less slowly if not decrease; and domestic demand is sluggish. FDI also falls as foreign investors are attracted to the late-starting countries.

Finally, in stage five, when wages and other costs of production become so high that even the best-practice domestic firms loses comparative edge, the industry will have to relocate in order to survive (Dowling and Cheang, 2000: 447). By the time of stage five, the developing country has already become a developed country.

Furthermore, as stated by Vernon, the overall scarcity of capital in developing countries will not prevent investment in facilities for the production of standardised products. Capital scarcity may not be a problem for two reasons: (1) the investment will take place in industries with significant labour inputs in the production process, and (2) the capital may be supplied at low cost due to the concession of beneficiary developing countries (Hong, Chapter 17: 7). Therefore, at the end of the product cycle's maturation stage, the inventing developed countries will become net importers of the standardised products.

A key problem with product cycle theory is that, despite the model's emphasis on firm strategy and the changing nature of demand, the model is deterministic. Once a new product is introduced, the transitions from one stage to the next, and the subsequent patterns of production location and trade, are seen as inexorable (Leichenko, 2000). Despite this limitation, product cycle theory has also been widely applied to analyse US regional growth and development (e.g., Markusen 1985; Rees 1979).

In addition, Linder (1961) earlier develops his arguments as follows. In a world of 'imperfect knowledge', e.g. lack of information about products, preferences, competitors, etc. in foreign markets, entrepreneurs first will produce goods for

domestic needs of which they are aware. As a successful firm grows, the local market becomes insufficient for further expansion. The trade horizon of the firm is gradually lifted. But, only after what has probably been a considerable period of producing for the domestic market will the entrepreneur become aware of the profit opportunities offered by producing for foreign countries. The export market will not be entered until then. In other words, the trade horizon of the firm will extend 'across national boundaries'. On the contrary, the country would not start on domestic production if the domestic demand for a certain good is less than the specified minimum amount; because it could not survive in the competition with foreign producers during the beginning period when the scope of domestic producers is limited to the local market. We can thus expect that the minimum-efficient-scale argument would not change the basic solutions of the Heckscher-Ohlin theorem, but would contribute to narrow more realistically the range of possible productive activities of each country. It also conforms to Linder's intention to narrow the range of potential exports by introducing the concept of 'representative demand'.

In summary, according to Hong (Chapter 17: 8), Linder's central hypothesis can be stated as follows: (1) the precondition for a good to be produced domestically is the presence of 'home demand'; (2) for a good to emerge as a potential export product, the internal demand for the good should be 'representative'; and (3) since the representative demand pattern determines the range of goods that can be produced with comparative advantage, the pattern of production and trade can be predicted on the basis of the internal demand patterns of the countries. Basically, Linder's world is regarded as a subset of the worlds, which could be generated by the Heckscher-Ohlin theory of factor proportions.

2.6 Cumulative Causation Theory

The theory of cumulative causation developed by Kaldor (1970) views regional growth as determined by the growth of demand for a region's exports. Kaldor's first law is that there exists a strong causal relation between the growth of manufacturing output and the growth of GDP. His second law of growth (1966) states that the manufacturing sector is subject to substantial increasing returns to scale. The central

point of this law not only provides support for the hypothesis that the manufacturing sector is the 'engine of growth', but also sets the basis for the cumulative causation models of growth. According to Verdoorn's law (1949), a positive correlation exists between the growth of productivity, measured by the rate of growth of output per employee and the growth rate of employment. Later Kaldor (1967) modified this reasoning by replacing employment growth by output growth. The resulting relationship became known as the Verdoorn-Kaldor law, which suggests that growth of productivity in manufacturing is an endogenous result of the growth of output, because of static and dynamic economies of scale. Economies of scale can be divided into two groups: (1) economies resulting from large-scale production (static economies of scale); and (2) economies of scale derived from 'the insight that the spatial concentration of economic activity can produce externalities' (dynamic economies of scale) (Malecki and Varaiya, 1986). The latter consists of cumulative advantages that originate from the growth of industry itself, like learning-by-doing, and the development of skill and know-how, the opportunities for easy communication of ideas and experience, and the opportunity of ever-increasing differentiation of process and of specialisation in human activities (Kaldor, 1970).

Kaldor's third law states that there exists a strong positive causal relation between the growth rate of the manufacturing sector and that of productivity outside the manufacturing sector, because the diminishing returns in agriculture and the small service sectors will supply excessive labour to the industrial sector. If the marginal product of labour is below the productivity in these sectors, the productivity will rise as employment is contracting. According to Thirlwall (2002: 42), Kaldor's arguments on the driver of growth in the manufacturing sector come from demand in agriculture in the early stages of development, and export growth in the later stages. In the later stages, a fast growth of exports and output may set up a virtuous circle of growth with rapid export growth leading to rapid output growth, and rapid output growth leading to fast export growth through the favorable impact of output growth on competitiveness.

In the regional literature, a detailed interpretation is given to the Verdoorn-Kaldor law. For this law to be true, according to regional economists, it has to be assumed

that 'the increased investment resulting from higher growth in a region is located in the same region' (Malecki and Varaiya, 1986: 632). The reason is the growth in investment of a region is enhanced by higher growth of that region. According to Caniels (1996), part of this investment will be devoted to research and development (R&D), and the resultant benefits of this increased R&D investment are only reaped in this same region, thus only in this region productivity grows. This in turn will cause a rise in the output of the region, i.e. the region will experience growth. In this process, there is no diffusion of technology at all. The benefits of technical progress stay within the region that experiences the benefits of increased investment, and therefore only this region shows an increase in productivity. This reasoning (referred to as *the principle of circular and cumulative causation* by Myrdal (1957) explains why differences in productivity among regions may be persistent rather than a transitory state, as in the neoclassical model. As Kaldor (1970: 340) argues, the principle of circular and cumulative causation 'is nothing else but the existence of increasing returns to scale in processing activities'.

Of course, by assuming technology to be completely immobile, as opposed to the neoclassical view of complete mobility, Kaldor advocates another extreme and therefore unrealistic assumption. A theory based on imperfect mobility and slow diffusion of technology might approach reality much more (Caniels, 1996). Despite the cumulative causation theory has limited success; it has had a substantial influence on conceptions about regional growth (Thirlwall, 1980).

With respect to the question of causality between exports and regional output growth, the Verdoorn-Kador's theory suggests that, for a given country an expansion of the export sector may cause specialisation in the production of export products, which may increase the productivity level, and the level of skills in the export sector. This may then lead to a reallocation of resources from the relatively less efficient non-trade sector to the more productive export sector. This productivity increase may then lead to output growth. Also, Kaldor's model suggests that growth outside export demand is the triggering mechanism for the growth of a region's economy and the subsequent feedback relationship (Leichenko, 2000).

2.7 New Trade Theory

According to Ezeala-Harrison (1999: 22), the new trade theory (NTT) emanates from the new growth theory (NGT) that emerged within the international trade and economic growth and development literature during the early 1990s. The NGT[15] emphasises technological progress (and the determinants of technological progress) as well as the externalities that the development and application of new knowledge confers, as explicit variables that determine economic growth. Apparently, it posits that innovations take place more in some countries than others because of, among other things, differences in the development of science in the countries, the relative levels and quality of their research institutions, and the relative levels and quality of their educational systems.

The central point of this theory is the diffusion of knowledge between firms as knowledge is given as a key factor of production. Therefore, the main fundamental nature of NGT is its implications that firms should invest more in knowledge, as much as in other capital resources in order to be productive or maintain productivity. The association between the NGT and the NTT lies in their common magnitude of technology and the diffusion of knowledge in the relative flow of the gains from trade to trading countries. These theories are regarded as 'new' as they derive from the traditional neoclassical trade theories based on the principles of comparative advantage, which emphasises the differences between nations' resource endowments (Ezeala-Harrison 1999). The NTT was developed to explain high levels of intra-industry trade and the large proportion of world trade that takes place between similar countries (Dicken 1998; Poon 1997). It suggests that the existence of increasing returns to scale and imperfect competition provides reasons for specialisation and trade, even when countries are similar in factor endowments (Krugman 1979; Helpman and Krugman 1985).

The importance of increasing returns to scale and imperfect competition not only help to reshape traditional trade theory, but it also has had a significant influence on

[15] Paul Romer (1986) suggests externalities to research and development (R&D) expenditure. Robert Lucas (1988) insists in externalities to human capital formation (education). Grossman and Helpman (1991) focus on technological spillovers from trade and foreign direct investment.

thinking about trade policy, providing new justification for trade protectionism (Grant 1994; Poon 1997). Although the majority of work within NTT assumes that increasing returns are internal to the firm, several studies from Marshall (1920) show that increasing returns are external to the firm (e.g. Krugman 1991; Krugman and Venables 1993).

Also, Krugman model (1991) shows that trade, in the presence of external economies of scale, leads to regional concentration of scale-intensive industries. With respect to longer term regional impacts of trade, Krugman also points out that these impacts tend to be cumulative and self-reinforcing. Economies of agglomeration, which increase with increasing regional size where a centre for production and exporting is set up (e.g. industrial park, export zones etc.), tend to provide this centre permanent cost advantages over other locations. These scale and cost advantages are reinforced by the relatively higher wages that are paid to workers in the scale-intensive industries.

A key problem with this model and with other external increasing returns models is the lack of, and adequate explanation for, the initial establishment of the industrial core and for shifts in the location of the core (Martin and Sunley 1966).

2.8 Conclusion

This chapter recapitulates some of the trade and growth theories in the history of development economics from the eighteenth century to the close of the twentieth century, which laid the groundwork for the empirical analyses in the following chapters.

Following the remarkable success of the first-tier East Asian countries in the 1970s, and the second-tier South-East Asian countries in the 1980s, the ELG paradigm has received special attention, especially if compared to the large malfunction of import substitution policies in many countries of Africa and Latin America.

Vietnam is a latecomer in the process of economic development and integration into the world economy, with outstanding economic and export growth (as briefly discussed in Chapter One) since its implementation of Doi-Moi in 1986, transforming its national economic policy from a centrally planned system to a market economy. It is undoubtedly a curious and interesting question for scholars, researchers as well as for Vietnamese policymakers whether Vietnam's economic achievements in the past twenty years have been based on the premise of export-led growth, or growth-led export or even a bidirectional relationship? To answer the causality between the two key variables, real economic growth and real export growth of goods and services, is very important for Vietnam as well as the ASEAN-4 countries since it would help the policymakers in designing appropriate policies and strategies to sustain the national economy on the right path of long-term high growth.

Chapter Three is thus set apart for this purpose.

Chapter Three

TRADE AND GROWTH: AN EMPIRICAL ANALYSIS OF THE ASEAN-5's CAUSALITY BETWEEN EXPORTS AND OUTPUT GROWTH

3.1 Introduction

As briefly mentioned in the conclusion of Chapter Two, the world has witnessed the spectacular 'first wave' economic development of the four tigers in East Asia such as Hong Kong, Singapore, South Korea and Taiwan, whose real economic growth recorded an average annual rate of almost 9 per cent during the 1960s and 1970s and more than 7 per cent during the 1980s and 1990s by adopting the outward-looking export-oriented industrialisation strategy. The world once again has seen the successful evolution, at a lesser extent, of the 'second wave' Southeast Asian 'baby' tigers such as Indonesia, Malaysia, the Philippines and Thailand; which adopted the same export-oriented strategy from the 1970s. Then in 1986, one of the latter comers in Southeast Asia who is striving to join in the race, applying the same strategy, in order to catch up the ASEAN-4 is Vietnam. Has this outward-looking export-oriented strategy been appropriate to sustain high economic growth in Vietnam in the long run? Have Vietnam's economic achievements in the past twenty years been based on the premise of export-led growth (ELG) or growth-led export (GLE) or even a bidirectional relationship?

The question that often has been asked by development economists is whether economic growth is driven by the growth of exports (ELG), or export growth is just an inevitable consequence of surplus commodity expansion due to excessive supply in the country's domestic market (GLE), or the growth of export and output has mutual impacts on each other (feedback relationship) or else?

In empirical studies, with respect to ASEAN-4 countries, the studies of Jung and Marshall (1985), Piazolo (1996) and Islam (1998) examine the causal relationship between these two key variables for Indonesia and their results support the ELG. Xu's (1996) study also confirms that the output growth of Indonesia, Malaysia and the Philippines has run from the growth of export. Empirical results of Dodaro (1993), Ghatak, Milner and Utkulu (1997), Ekanayake (1999) and Keong, Yusop and Liew (2005) also find Malaysian economy is driven by the growth of export. Furthermore, while the ELG is supported by Dutt and Ghosh's (1996) study for the Philippines, Rahman and Mustafa's (1997) research also support the ELG hypothesis for both the Philippines and Thailand.[16]

In contrast to these results underpinning the ELG, some other studies support the GLE hypothesis such as Ahmad and Harnhirum (1996) for all the ASEAN-4 countries, Jung and Marshall (1985) for Thailand, Rahman and Mustafa (1997) for Indonesia and Al-Yousif (1999) for Malaysia. Meanwhile, results of some others suggested that a feedback relationship exists between these two variables, for instance Ekanayake (1999) for Indonesia, the Philippines and Thailand; Rahman and Mustafa (1997) and Baharumshah and Rashid (1999) for Malaysia; Bahmani-Oskooee and Alse (1993) for the Philippines and Thailand; Xu (1996) for Thailand; and recently Amrinto (2006) for the Philippines and Furuoka (2007) for Malaysia. Lastly, some results confirmed that there is no such causality between export growth and output growth in the studies of Islam (1998) for Malaysia, the Philippines and Thailand, of Bahmani-Oskooee and Alse (1993) for Malaysia, of Dodaro (1993) for the Philippines and Thailand, of Jung and Marshall (1985) for the Philippines and of Dutt and Ghosh (1996) for Thailand.

To the best of my knowledge, there are many studies investigating this causal relationship between trade and output growth for the ASEAN-4 countries but none has been done so far for Vietnam, other than a study of Arnade and Vasavada in 1995 for sixteen Latin American and seventeen Asian and Pacific Rim countries including Vietnam. However, the variables used in the analysis were real agricultural output and real agricultural exports over 1961-1987, and the result for Vietnam was no causality. The reason for not having many researches on trade-and-growth causality may be the

[16] See Table 3.1 for more details of each study's time series, variables and methodology used.

lack of Vietnam's data from the national and international sources in the past decades when Vietnam was under a centrally planned economic system, and its statistical principles adhered to a Soviet-style conventional system.

As mentioned in Chapter One, 'the positive correlation between Vietnam's log real GDP and log real exports of goods and services [17] for the 1989-2006 period was very strong with 99.4 per cent, and significant at the 0.05 level, the logarithm linear regression between these two variables also explains (by its adjusted coefficient of determination, $\overline{R^2}$) their relation strength that was very high at 98.7 per cent over the same period' (Lam, Chapter 1: 12). However, the causal relationship between these two key variables, log real GDP and log real exports of goods and services is still a 'mystery'.

Therefore, in a comparison context with the ASEAN-4, the purpose of this chapter is to investigate the role of trade (exports) in Vietnam's economic development. Specifically, it focuses on analysing the causality between these two abovementioned variables by using comprehensive econometric techniques such as unit root test, cointegration test, error correction model (ECM), pair-wise Granger causality and impulse response function (IRF) in vector auto regression (VAR).

In brief, the remainder of this chapter is structured as follows. Section 3.2 briefly reviews the literature on the export-led-growth hypothesis. Section 3.3 presents the ASEAN-4's previous empirical studies. While methodology and data are discussed in Section 3.4, Section 3.5 presents and discusses the empirical results of previous studies and this study, and finally Section 3.6 concludes the chapter.

[17] Exports of goods and services represent the value of all goods and services provided to the rest of the world. Included is the value of merchandise, freight, insurance, travel, and other non-factor services. Wages, salaries and property income (formerly called factor services), such as investment income, interest, and labour income, is excluded (the World Bank's definition).

3.2 Literature Review on Export-Led Growth Hypothesis

The neoclassical view is that economic growth can be achieved by the ELG hypothesis. This neoclassical view argues that trade, in fact, was the main engine of growth in the East Asian newly industrialised countries (NICs).[18] The so-called Four Tigers have been successful in achieving high and sustained rates of economic growth since the early 1960s because of their free-market, outward-oriented economies (World Bank, 1993). In general, according to Medina-Smith (2001: 1):

> The ELG postulates that export expansion is one of the main determinants of growth. It holds that the overall growth of countries can be generated not only by increasing the amounts of labour and capital within the economy, but also by expanding exports as exports can perform as an engine of growth. The association between exports and growth is often attributed to the possible positive externalities for the domestic economy arising from participation in world markets, for instance from the reallocation of existing resources, economies of scale and various labour training effects. However, these mechanisms are frequently invoked without any theoretical support or any empirical proof.

The advocates of the ELG hypothesis and free trade point out that most developing countries that followed inward-oriented policies under the import substitution strategy (mostly in Latin America) had poor economic achievements (Balassa, 1978, 1980, 1985). Some of them confirm on average a complete lack of growth, while real income declined between 1960 and 1990 (Barro and Sala-i-Martin, 1995). Bruton (1989) states that those countries that adopted the import substitution strategy as in Latin America, were unable to shift to a more outward approach when the first stage of this strategy came to an end, and became increasingly vulnerable to external events. Most of them turned out to be increasingly dependent on short-run capital inflows, particularly from private banks, in order to maintain their levels of imports for consumption. This was the case of most Latin America countries, which were greatly affected by the debt crisis of the early 1980s. In fact, Thirlwall (1980) suggests that,

[18] The East Asian NICs or *'first-tier' NICs* or the *Four Tigers* are Hong Kong, South Korea, Singapore and Taiwan.

as a rule of thumb, the growth rate of most countries can be approximated by the rate of growth of exports divided by the income elasticity of demand for imports because ultimately growth is balance-of-payment constrained.

Consequently, by the mid 1980s, the economic literature concerning development economics, economic growth, adjustment and stabilization programs had quickly rejected the inward-oriented approach and were suddenly placing great emphasis on export-led strategy. Most macroeconomic theorists and policy makers in developing countries rapidly embraced the new wisdom, in the belief that by following this scheme their countries would achieve or regain the high rates of growth of the past (Medina-Smith, 2001:3)

Balassa (1980) first states that in general, the production of export goods is concentrated in those economic sectors of the economy, which are already most efficient; export expansion thus helps channel investment in these sectors, which in turn increases the overall productivity of the economy. Second, a large export sector also allows a country to gain from economies of scale and positive externalities that may lead to increased growth (Tyler, 1981). This argument proposes that domestic markets are too small for optimal scale to be achieved, while increasing returns may occur with access to foreign markets (Giles and Williams, 2000). Third, foreign competition increases the pressure on industries exporting goods to keep costs relatively low and to promote technological changes, which in turn improves productivity (Michaely, 1977; Kavoussi, 1984), and may cause the workers' general skill level to rise in the export sector. Fourth, the growth of exports has a stimulating effect on total productivity of the economy as a whole through its positive impact on higher rates of capital accumulation (Kavoussi, 1984).

Fifth, an argument can be based on the two-gap model (Chenery and Strout, 1966), which states that if the foreign exchange constraint is binding, then the growth of exports reduces the foreign exchange constraint, thereby facilitating imports of capital goods and faster growth (Voivodas, 1973; Williamson, 1978; Fajana, 1979). Sixth, Feder (1983) measures the contribution of exports to economic growth through resource allocations. He validates his argument by dividing the economy into export and non-export sectors with the assumption that marginal productivity is higher in the

export sector. Exports are then introduced into the production of the non-export sector as an additional factor, and a significant coefficient result indicates that exports have generated positive externalities for the non-export sector. Seventh, the export sector's expansion increases employment and real wages leading to domestic spending as another source of output growth (Athukorala and Menon, 1996). Finally, an outward-oriented strategy of development may provide greater opportunities and rewards for entrepreneurial activity, which is the key to extended growth, as it is the entrepreneur who will seek out risk and opportunity (Lal and Rajapatirana, 1987).

Obviously, all the above arguments support the hypothesis that a causal relationship flows from the growth of export to the growth of output.

In contrast to the ELG is the growth-led export (GLE) hypothesis, which postulates the growth of output leading to exports expansion. It assumes that when output growth, induced by some specialising and comparative advantage industries, increases faster than domestic demand, then the need to export their products to foreign markets is inevitable. For example, primary-input growths or factor-productivity growths through the effects on supply side such as factor endowments are responsible for output growth. Lancaster (1980) and Krugman (1984) state that economic growth leads to enhancement of skills and technology, which in turn increase the comparative advantages for the country that facilitates exports. Jung and Marshall (1985) argue that, in the case of unbalanced growth, producers will be forced to seek out foreign markets for their commodities when domestic demand is less than excessive production. In this case, the causality flows from output growth to export growth and this cannot be interpreted as evidence of ELG. Their study, based on the Granger causality tests for thirty-seven developing countries over 1950-81, finds evidence for the ELG hypothesis in only five countries included in the sample, which were Indonesia, Greece, Egypt, Costa Rica and Ecuador. Similarly, Ahmad and Kwan (1991) find no support for the ELG hypothesis in their empirical study (over 1981-87) for forty-seven African developing countries.

In the same year, Bahmani-Oskooee et al. (1991) find that the ELG hypothesis supported in only five countries[19] out of twenty less-developed ones over the 1951-87 period. Dodaro's study (1993) for 1967-86 shows evidence to support the ELG hypothesis in only eight[20] out of eighty-seven countries. Greenaway and Sapsford (1994a) find no evidence to support the ELG hypothesis when using the OLS simple regression function between real GDP per capita growth and the growth of exports for fourteen countries over 1957-85. Ahmad and Harnhirum (1996) investigate the causal relationship between real exports per capita and real GNP per capita for five ASEAN countries[21] over the 1966-88 period, and conclude that economic growth in the ASEAN region appears to be consistent with a variety of different hypotheses, which all point to an important role for the 'internally generated' mechanism rather than export promotion. Also, Rodrik (1995) asserts that industrial policies played a most important role by creating a particularly favourable environment for domestic investment.

The third possible hypothesis is a bi-directional (or feedback) causal relationship between exports and output growth. Helpman and Krugman (1985) propose that the realisation of economies of scale due to productivity gains may enhance exports; the rise in exports may further enable cost reductions, which may result in further productivity gains. Also, increased trade produces more income, which leads to more trade and so on (Bhagwati, 1988).

One year earlier, Chow (1987) applies causality tests on annual time series data of real manufactured exports and real manufactured output over 1960-84 for eight newly industrialising countries (NICs) to find evidence of bi-directional causality in the case of Brazil, Hong Kong, Israel, South Korea, Singapore and Taiwan, and no causality in the case of Argentina. Yaghmanian (1994) estimates cross section and time series regressions for sixty-six developing countries, by including typical neo-classical variables such as the share of investment in GDP, population growth rate and export growth rate, and the initial results support the ELG hypothesis. However when the variable of population is replaced by employment variable for thirty countries, the

[19] These five countries were El Salvador, Greece, Morocco, Peru and Taiwan.
[20] Bangladesh, Ethiopia, Uganda, El Salvador, Syrian Arab Republic, Malaysia, Costa Rica and Malta.
[21] Indonesia, Malaysia, Philippines, Singapore and Thailand.

results do not support ELG. Ekanayake (1999) examines the causal relationship between exports and GDP for eight Asian developing countries, using annual data from 1960 to 1997, and finds that a bi-directional causal relationship between these two variables exists in seven out of eight countries considered, which were India, Indonesia, South Korea, Pakistan, the Philippines, Sri Lanka and Thailand. The only country that experienced ELG is Malaysia. Also, Shan and Sun (1999) test the ELG hypothesis, using quarterly time series data for the US economy, and the results indicate a bi-directional causal relationship between output growth and export growth.

Finally, there would be no causal relationship between exports and economic growth when the growth paths of these two variables are independent of each other; or say in other words, are determined by the other unrelated variables in the economic system. It is argued that higher growth rates are not necessarily determined by exports, but by processes that are independent of trade policy (Pack, 1988, 1992). Also, Rodrik (1994b: 2) argues that an exogenous increase in investment in a developing country with a comparative disadvantage in producing capital goods, such as South Korea, will necessitate an increase in imports of such goods (and in turn an increase in exports to pay for the imports). Similarly, Bradford and Chakwin (1993) argue that causality runs from investment to growth and exports, rather than the other way around.

In this regard, Sheehey (1990, 1993) states that the link between sectoral growth and the growth of GDP is common to all sectors; it is not due to relative productivity differences or externality effects. He argues that the empirical causality test had no relevance for the ELG/GLE controversy by applying the same test to each of the major sub-categories of GDP such as government expenditure, private consumption, agriculture, manufactures, construction and electricity, gas and water services; Sheehey then substitutes exports with other components of GDP in the production function, and the results show all significance. To prove his point, in a later test, Sheehey (1993) uses non-export sector substituted for the export sector in the production function and the results remain unchanged. These tests generate contradictory results with those of Feder as mentioned above. Also, Dollar (1992) suggests that it is possible the causation runs in the other direction such as from poor

growth performance to inward-orientation. An external factor such as debt crisis may cause slackness for both economic and export growth. Finally, the link between export growth and economic growth is still inconclusive of whether more trading leads to growing faster or faster output growth drives more trading as raised by the World Bank (1987) that the link between trade strategy and macroeconomic performance is not entirely clear and raise the question of whether outward orientation leads to better economic performance or superior economic performance paves the way for outward orientation. Also, Harrison (1995: 26) concludes that 'existing literature is still unresolved on the issue of causality'.

The answer probably depends on the actual circumstances of each individual country with respect to its natural, physical and human resources as well as trade, industrial, and foreign exchange policies etc. In brief, there are four possible types of causality between the growth of exports and the growth of output:

- export-led growth (ELG): unidirectional causality runs from exports to economic growth (EXP → GDP);
- growth-led export (GLE): unidirectional causality runs from economic growth to the growth of export (GDP → EXP);
- bidirectional causality (BDC): unidirectional causality runs from export growth to economic growth and vice versa (EXP ↔ GDP); and
- no causality (NC): independent relationship between the growth of export and the growth of output.

3.3 Previous Studies on the ASEAN-4

The empirical literature on ELG hypothesis consists of two types of studies: cross-country and time-series analyses. Of course, the results on both types normally are contradictory from one study to another for the same country due to various differences in time series (period, frequency), data variables, model (bivariate/multivariate) and techniques used in each study. Table 3.1 presents the previous studies' summary of results on causality between the ASEAN-4's export growth and output growth. In a latter section, these results will be compared again to those of themselves and of Vietnam drawn from this study.

Table 3.1: ASEAN-4's Causality between Export and Economic Growth from Previous Studies

					Indonesia		Malaysia		Philippines		Thailand	
	Time-Series	Model	Methodology	Variables	S-R	L-R	S-R	L-R	S-R	L-R	S-R	L-R
Mahadevan (2007)	*1974-03*	*Multivariate*	*ADF, KPSS /MWald*	*EXP, IMP, GDP, Trade-adjusted GDP, TFP, LP,*				BDC [(b)]				
Furuoka (2007)	*1970-04*	*Bivariate*	*ADF / JJ / VECM*	*EXP, GDP*			GLE	BDC				
Amrinto (2006)	*1981-04*	*Multivariate*	*PP / EG-ADF / VECM*	*EXP (goods & services), GDP, ER, CAP*					BDC	BDC		
Keong, Yusop & Liew (2005)	*1960-01*	*Multivariate*	*ADF, PP / ARDL*	*EXP, IMP, GDP, LF, ER*			ELG	ELG				
Ekanayake (1999)	*1960-97*	*Bivariate*	*ADF / EG-ADF, JJ / VECM*	*EXP, GDP*	ELG	BDC	GLE	ELG	GLE	BDC	GLE	BDC
Baharumshah & Rashid (1999)	*1970-94*	*Multivariate*	*ADF, PP / JJ / VECM*	*EXP, GDP, AX, MX, IM*				BDC				
Al-Yousif (1999)	*1973-93*	*Multivariate*	*ADF / WS / JJ / VECM*	*EXP, GDP,EI ,ER, CAP*			ELG	GLE				
Islam (1998)	*1967-91*	*Bivariate*	*ADF, JJ, VECM*	*EXP, GDP*		ELG		NC		NC		NC
Rahman & Mustafa (1997)	*20 years [(a)]*	*Bivariate*	*ADF / EG-ADF, JJ / ECM*	*EXP, GDP*	GLE	GLE	BDC	BDC	BDC	ELG	BDC	ELG
Ghatak, Milner & Utkulu (1997)	*1955-90*	*Bivariate*	*ADF / JJ / VECM*	*EXP, GDP/EXP, Non-EXP GDP*				ELG				
Xu (1996)	*1951-90*	*Bivariate*	*AD / EG-ADF / VECM*	*EXP, GDP*		ELG		ELG		ELG		BDC
Piazolo (1996)	*1965-92*	*Multivariate*	*ADF, PP /EG-ADF, JJ /VECM*	*EXP, GDP, GE, P, INV, INF, NFDI*		ELG						
Dutt & Ghosh (1996)	*1953-91*	*Bivariate*	*DF, PP /EG-ADF / VECM*	*EXP, GDP*						ELG		NC
Ahmad & Harnhirum (1996)	*1966-88*	*Bivariate*	*ADF, JJ / VECM*	*(EXP, GDP) per capita*		GLE		GLE		GLE		GLE
Bahmani-Oskooee & Alse (1993)	*1973-88*	*Bivariate*	*ADF / CRDW, DG-ADF /VECM*	*EXP, GDP*				NC		BDC		BDC
Dodaro (1993)	*1967-86*	*Bivariate*	*OLS simple regression*	*Growth of (GDP, EXP of goods & non-factor services*		BDC		ELG		NC		NC
Jung & Marshall (1985)	*1950-81*	*Bivariate*	*VARD / VARD^2*	*Growth of (GDP, EXP)*		ELG				NC		GLE

Notes:

(1) S-R = short run, L-R = long run, ELG = export-led growth, GLE = growth-led export, BDC =bi-directional causality, and NC = no causality.

(2) Blank spaces indicate countries not included in the studies, and short- run results are not available in some studies.

(a) Rahman & Mustafa's study mentioned the time series of 20 years but not specified the time period; (b) This result is based on Exports and Trade-adjusted GDP.

Methodology:

(1) Unit Root Test: ADF = Augmented Dickey Fuller; PP = Philips & Perron; WS = Weighted Symmetric; KPSS = Kwiatkowski-Phillips-Schmidt-Shin.

(2) Cointegration Test: EG-ADF = Engle-Granger Augmented Dicker Fuller; JJ = Johensen & Julius.

(3) Model: OLS = Ordinary Least Square; ECM = Error Correction Model; VECM = Vector Error Correction Model; ARDL = Autoregressive Distributed Lag;

MWald =Modified Wald test; VARD = First VAR Difference; $VARD^2$ = Second VAR Difference.

Variables:

EI = Employment Index; EXP = Export; IMP = Import; LF = Labour Force; LP = Labour Productivity; TFP = Total Factor Productivity; ER = Exchange Rate; AX = Agricultural Exports; MX = Manufacturing Exports; CAP = Capital; $\dot{G}E$ = Government Expenditure; P = Population; INV = Investment; $\dot{I}NF$ = Inflation; NFDI = Net Foreign Direct Investment.

3.4 Methodology and Data

As mentioned earlier, the purpose of this chapter is to investigate the causality between exports and economic growth in Vietnam and the ASEAN-4 countries to verify whether or not the growth of export provides a significant contribution to the growth of output. According to Thirlwall (2002: 53):

> In static macroeconomic theory, national income (output) is the sum of consumption expenditure, investment and exports, minus imports. If we take this approach, the role of exports is immediately apparent. Exports differ from other components of demand in three important respects. Firstly exports are the only true component of autonomous demand in an economic system, in the sense of demand emanating from outside the system. This is very important to bear in mind. The major part of consumption and investment demand is dependent on the growth of income itself. Secondly, exports are the only component of demand that can pay for the import requirements for growth. It may be possible to initiate consumption-led growth, investment-led growth or government expenditure-led growth for a short time, but each of these components of demand has an import content (that is why imports are subtracted in the national income equation). If there are no export earnings to pay for the import content of other components of expenditure, demand will have to be constrained. In this respect, exports are of great significance if balance of payments equilibrium on current account is a long-run requirement. What it means is that exports have not only a direct effect on demand, but also an indirect effect by allowing all other components of demand to rise faster than otherwise would be the case.

Furthermore, it is noted that imports are excluded in this test, as Fosu (1990b) indicates that one might wish to include imports in the equation or even replace exports, however, besides the fact that imports are likely to be heavily dependent on income, imported goods are unlikely to yield the production economies attributed to exports. This is particularly true in the case of Vietnam as the majority of imports were capital goods used for import-substitution industries by SOEs, as stated by EAAU (1997: 43): 'a high proportion of imports are capital and intermediate goods financed by foreign direct investment and other capital inflows'.

This study employs the bivariate model by using the techniques of unit root test, cointegration test, pair-wise Granger-causality test, error-correction model and impulse response function in vector autoregressive model to verify the causal relationship between real output growth and real exports of goods and services as mentioned in the introductory part.

According to Ekanayake (1999: 45): 'These econometric techniques have gained popularity in recent empirical research for a number of reasons including: (a) the simplicity and relevance in analysing time-series data, (b) the ability to deal with non-stationary variables, and (c) to provide additional channels through which Granger-causality could be detected when two variables are cointegrated'.

The concept of cointegration was introduced by Granger (1969) and developed further by Engle-Granger (1987) and Johansen (1988). While Johansen dealt with the concept by establishing the *vector autoregressive model*, Engle and Granger developed the so-called *two-step method.* Economic researchers to study the long-run equilibrium relationship of economic variables have broadly used both these model and procedure. Testing for causality or cointegration between the two variables, real GDP and real exports of goods and services (expressed in logarithmic form) in Vietnam and the ASEAN-4 is performed in two steps. First, the time-series properties of each variable are examined by the unit root tests, which test whether real exports of goods and services[22] (LREXP = log real exports) and real GDP (LRGDP = log real GDP) are *stationary*, or integrated of order zero, *I (0)*. Then, the next step is to explore whether the cointegration exists between LREXP and LRGDP by using the Engle-Granger two-step cointegration procedure and Johansen-Julius cointegration technique.

3.4.1 Stationary versus Non-stationary Time Series

As defined, a data process is covariance stationary if its mean and variance are constant over time and the value of the covariance between two time periods depends only on the lag between the two time periods, and not on the actual time at which the covariance is computed. In brief, a time series or stochastic process (y_t) is said to be stationary if it shows the following properties:

[22] From now on, real exports of goods and services are briefly said as real exports.

- $E(y_t) = E(y_{t-s}) = \mu$
- $E[(y_t - \mu)^2] = E[(y_{t-s} - \mu)^2] = \sigma^2$
- $E[(y_t - \mu)(y_{t-s} - \mu)] = E[(y_{t-j} - \mu)(y_{t-j-s} - \mu)] = \gamma_s$.

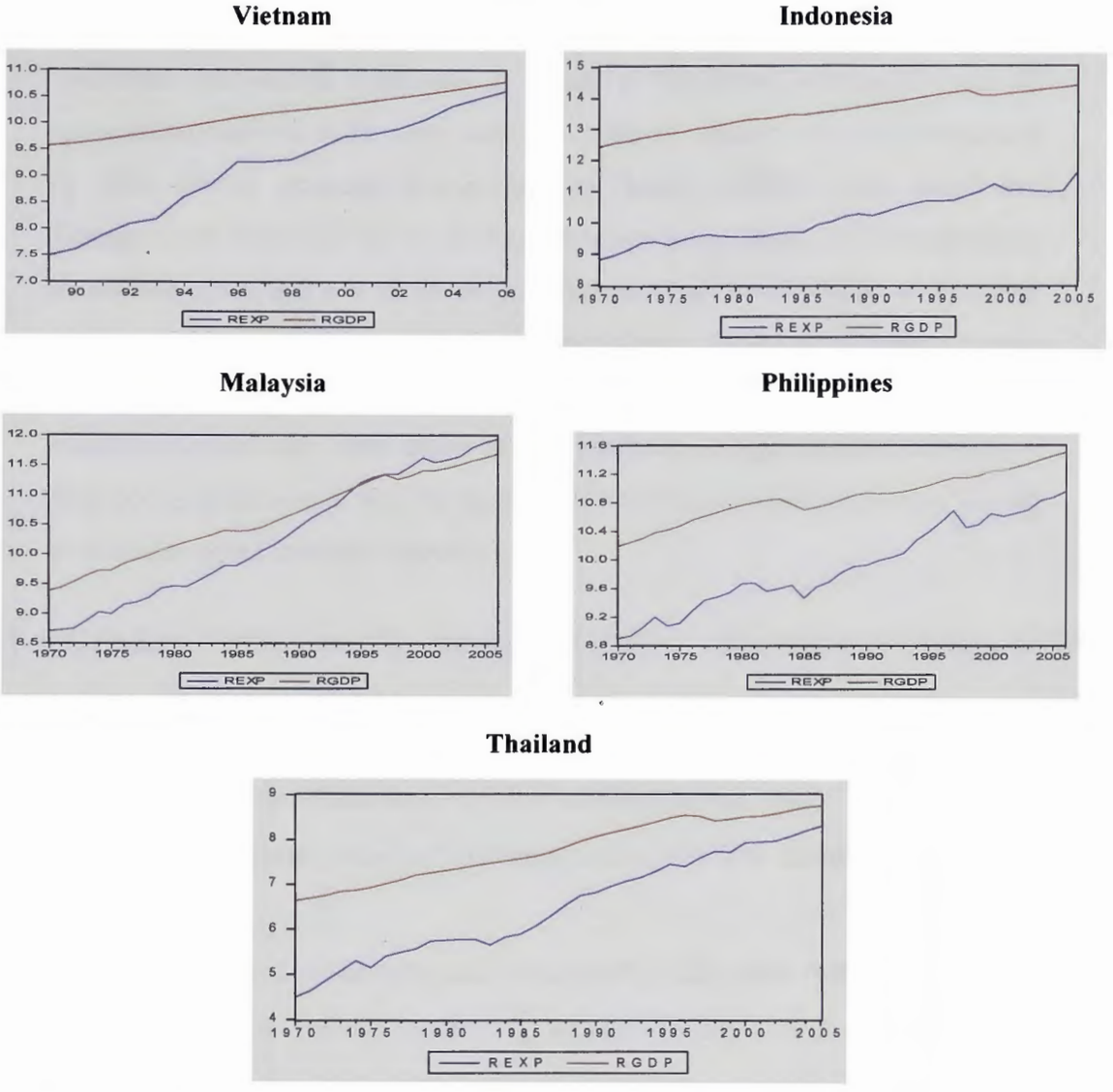
where μ, σ^2, and $\gamma(s)$ are finite and independent of *t*. Worth noting is that a covariance stationary series is also known as a weakly stationary, a second-order stationary, or a wide-sense stationary.

By definition, if a non-deterministic time series has a stationary invertible ARMA representation after differencing *d* times, it is said to be integrated of order *d*, denoted by: $y_t \sim I(d)$ if $(1-L)^d y_t$ is stationary. When $d = 0$, the series y_t is stationary in levels of its values. When $d = 1$, the levels change from one time period to the next and turn to be stationary. The difference operator often removes certain stochastic trends in a *I (1)* non-stationary series in order to obtain a stationary one.

Among many others, Nelson and Plosser (1982) state that, most macroeconomic time series are difference stationary (become stationary after differencing one or more times) rather than trend stationary processes (become stationary when the trend factor is incorporated in the model).

Before testing for Granger causality, it is important to establish the properties of the time series involved. In other words, we should investigate the order of integration and the existence of common trends between the two time series, LREXP and LRGDP. A visual inspection of the ASEAN-5's two time series presented in Figure 3.1 suggests that the data series are trended. Therefore, the model selected for this study is *trend and intercept*. However, it is hard to say whether the trend components are deterministic or stochastic, and whether the LREXP and LRGDP series have any common trend. This suggests that the right way to model economic variables is to test for their order of integration by using unit root tests and if they are both *I(1),* then applying the cointegration technique to find out if a long-run equilibrium does exist between them.

Figure 3.1: ASEAN-5's Log Real GDP and Log Real Exports of Goods and Services, 1970-2006 (1989-2006 for Vietnam)



Source: Outputs from Eview 6.1.

It is noticeable that when conducting standard econometric analysis using time series, which involve unit root processes, if the time series have stochastic trends and the residuals are non-stationary (or not 'white noise' = has zero mean and finite variance), the regression of one of them on the other will be *spurious*. A spurious regression tends to produce an impressive result with a high coefficient of determination (R^2) and significant *t*-statistics. However, the results are meaningless, as they tend to accept a false relation (type II) or reject a true relation (type I). Further, with respect to using differenced time series as mentioned above to transform a non-stationary time series to a stationary one, Chiarella and Gao (2002: 2) state:

The problem of using differenced time series had been realised by some British econometricians from previous negative experiences. For instance, Sargan (1964) introduced the error correction mechanism (ECM) in order to retain the long-term information contained in levels of variables and avoid (type II) spurious regressions at the same time. This line of research was further pursued by other British econometricians such as Hendry (2000). Later, Engle and Granger (1987) proved that for cointegrated time series there is ECM underlying these time series, and a VAR model in differenced variables will be misspecified if the variables are cointegrated. Thus, regression of the levels of non-stationary time series became valid again under the name of cointegration. Although some econometricians have been aware of the drawback of regression of differenced time series, it remains a fact that econometric textbooks have not pointed out the problem of type I spurious regression.

In brief, Enders (1995) generally summarises the four cases that a regression between the two time series may fall into:

- Both y_t and x_t are stationary => OLS applied to this case.
- y_t and x_t are integrated of different order => The result will be a spurious regression.
- y_t and x_t are non-stationary and integrated of the same order *but* the residual is not white noise, which means any shocks arising to the system is permanent => The result will be a spurious regression.
- y_t and x_t are non-stationary and integrated of the same order *and* the residual is stationary => A long-run equilibrium exists as y_t and x_t are cointegrated.

As a rule of thumb, the regression results are most likely spurious if the coefficient of determination is very high and the value of Durbin Watson is very low ($d < R^2$).

3.4.2 Unit Root Test

By definition, a unit root test is a statistical test for the proposition that in an autoregressive model of a time series, the autoregressive parameter is one. As an introduction of the concept of a unit root and its consequences, consider the Gaussian AR (1) process:

$$y_t = \varphi\, y_{t-1} + \delta + \varepsilon_t, \qquad t = 1, \ldots, T \qquad [3.1]$$

The null and alternative hypotheses are defined as follows:

$$Ho: y_t \sim I(1) \qquad [3.2]$$

$$H_A: y_t \sim I(0) \qquad [3.3]$$

The unit root case is $y_t \sim I(1)$, which applies if and only if $\varphi = 1$, while $y_t \sim I(0)$ implies the inequality $\varphi < 1$. Like many hypothesis tests, the null hypothesis should be specified as a simple equality in order that the distribution of the test statistic can be examined under the null hypothesis. This would not be possible in [3.1] if we use $y_t \sim I(0)$ as the null hypothesis. Thus, with respect to this AR (1) process, the null and alternative hypotheses in [3.2] and [3.3] can be expressed as:

$$Ho: \varphi = 1 \qquad [3.4]$$

$$H_A: \varphi < 1 \qquad [3.5]$$

Notice that the alternative hypothesis in [3.5] confirms this is a one-sided test. Now, consider a different AR (1) specification from [3.1] above in order to allow $E(y_t)$ to have the same characteristics under *Ho* and H_A.

Equation [3.1] becomes: $y_t - E(y_t) = \varphi[y_{t-1} - E(y_{t-1})] + \varepsilon_t$ [3.6]

with a linear trend specification for $E(y_t)$ as $E(y_t) = \beta_0 + \beta_1 t$. [3.7]

Substitute [3.7] into [3.6], we have:

$$y_t - \beta_0 - \beta_1 t = \varphi[y_{t-1} - \beta_0 - \beta_1(t-1)] + \varepsilon_t \qquad [3.8]$$

$$\Rightarrow y_t = \varphi\, y_{t-1} + \beta_0 (1-\varphi) + \varphi\beta_1 + \beta_1(1-\varphi)t + \varepsilon_t$$

$$\Rightarrow y_t = \varphi\, y_{t-1} + \delta + \gamma t + \varepsilon_t \qquad [3.9]$$

in which:

$$\delta = \beta_0 (1-\varphi) + \varphi\beta_1 \qquad [3.10]$$

$$\gamma = \beta_1 (1-\varphi) \qquad [3.11]$$

Thus, we should test the *I(1)* null hypothesis for y_t in the framework of the regression [3.9], rather than [3.1]. The null and alternative hypotheses for φ remain as specified in [3.4] and [3.5], specifically $\varphi = 1$ against $\varphi < 1$. However, under the alternative

hypothesis, y_t is not stationary (it cannot be stationary if $\beta_1 \neq 0$ and the mean varies with *t*), but rather y_t is trend stationary; that is, y_t is stationary around a deterministic trend. The null hypothesis is differenced stationarity, which means the variable is stationary after it has been differenced.

Further, it should be noted from [3.10] and [3.11] that substituting $\varphi = 1$ yields $\delta = \beta_1$ and $\gamma = 0$. By subtracting y_{t-1} from both sides, the equation [3.9] becomes:

$$\Delta y_t = \alpha y_{t-1} + \delta + \gamma_t + \varepsilon_t \qquad [3.12]$$

where $\alpha = \varphi - 1$. [3.13]

Therefore, with respect to φ as in [3.4] and [3.5], we can test the null and alternative hypotheses in the framework of [3.12] and [3.13] as below.

$$Ho: \alpha = 0 \qquad [3.14]$$

$$H_A: \alpha < 0 \qquad [3.15]$$

Equations [3.14] and [3.15] indicate that the null hypothesis will not be rejected if the estimated value of α is positive, and will be rejected for the estimated values of α that are negative and larger in magnitude than the critical value. This is also a one-sided test.

The unit root test of $\alpha = 0$ in [3.12] is called a *Dickey-Fuller test* as it is originally proposed by David Dickey and Wayne Fuller (1979). Later, they modified the test by including lagged first differences of y_t, and often referred to as an *Augmented Dickey-Fuller* (ADF) regression. The ADF test is based on the following equation:

$$(1-L)x_t = \alpha + \beta x_{t-1} + \sum_{i=1}^{n} \gamma_i (1-L)x_{t-i} + w_t \qquad [3.16]$$

where *L* is the lag operator and *n* is chosen to ensure that the residuals are white noise. The null hypothesis is that *x* is generated by a unit root process. The ADF test is calculated by dividing the estimate of β by its standard error and does not have the standard *t*-distribution, as *x* is not stationary under the null hypothesis. However, the test statistic's critical values have been provided by Fuller (1976).

If the calculated ADF test statistic is negative and larger in magnitude than the critical value, the null hypothesis of a unit root will be rejected, and x is said to be stationary. Conversely, if it is smaller than the critical value, the null hypothesis cannot be rejected and x is said to be non-stationary.

Generally, the results from the ADF test often depend on the lag length selected; therefore cautious attention must be paid when conducting the unit root test. In this study, the optimal lag for conducting ADF tests is based on the Akaike's final prediction criteria. In addition, the Phillips-Perron (PP) test is also used as a supplement to the ADF test to ensure all the test results are reliable. The convenience of this PP test is we don't have to worry about selecting the optimal lag length as in the case of the ADF test.

In 1988, Philips and Perron, based on the ADF regression, introduced a complementary alternative unit root test with the critical values the same as those used for the ADF tests. The PP test is based on the following equation:

$$x_t = \alpha + \beta\, x_{t-1} + \gamma(t - T/2) + w_t \qquad [3.17]$$

where T is the sample size, α, β, γ are the regression coefficients obtained by OLS, and w_t is a zero-mean disturbance term. The equation [3.17] above is also based on the following condition:

$$x_t = x_{t-1} + w_t \qquad [3.18]$$

Under the null hypothesis, we test whether [3.14] is true, which means φ must be equal to one. If this happens, then y_t has at least one unit root. In this study, we use the ADF as well as the PP to test the equation [3.12] above. According to Phillips (1987) and Perron (1988), the PP test has the following advantages:

- it does not require an assumption of homoscedasticity of the error term;
- there is no loss of effective observations from the series as lagged terms for the variables concerned are set to zero, which is especially useful if the number of data points is limited; and
- it corrects the serial correlation and heteroscedasticity of the error terms by a technique called the Bartlett window. This aims at providing the unit root test

results, which are robust to serial correlation and time-dependent heteroscedasticity of errors.

3.4.3 Cointegration Test

Cointegration is an econometric technique for modelling non-stationary but cointegrated time series. If two or more series are themselves non-stationary, but a linear combination of them is stationary, then the series are said to be cointegrated. More formally, consider two time series, y_t and x_t, both integrated of order *d*. According to Engle and Granger, if a linear combination $z_t = x_t - \varphi\, y_t$ is integrated of order *(d-b)* and $b > 0$, denoted by $y_t \sim CI\ (d,\ b)$; then x_t and y_t are said to be cointegrated.

The importance of cointegration is that if two variables are cointegrated then the regression of one of them on the other is not spurious. Many economic time series are generated by non-stationary random walks. However, in a model such as:

$$y_t = \alpha + \beta\, x_t + \varepsilon_t, \qquad [3.19]$$

It is occasionally to select coefficients that make $y_t - \alpha - \beta\, x_t = I(0)$. On the other hand, an empirical test result lets us know nothing about the short-run relationship between y_t and x_t. Indeed, if the two time series are both integrated of order one, we often reject the hypothesis of no relationship between them, no matter what the truth is; and accept a long-run equilibrium if they are cointegrated.

From [3.19] above, a quick test for cointegration is based on testing the stationarity of the error terms ε_t. The test procedure is exactly the same as testing for the unit root, where the equation to be tested specified as below.

$$\Delta\varepsilon_t = \lambda_0 + \lambda_1\varepsilon_{t-1} + \lambda_2 T + \sum_{i=1}^{n} \pi_i \Delta\varepsilon_{t-i} + \omega \qquad [3.20]$$

where λ_i and π_i are the parameters and ω is the error term. The number of lags (n) chosen in [3.20] should be sufficient enough to ensure the error term ω is white noise. Again, the null hypothesis is that the error terms are non-stationary. Therefore, an acceptance of this hypothesis means the series under investigation are not

cointegrated. If the λ_1 coefficient is significant, then the residual ε_t from [3.19] is stationary and the two variables y_t and x_t are cointegrated.

However, a more powerful technique for cointegration testing is suggested by Engle and Granger (1987). They have shown that if the two time series, for example LREXP and LRGDP are integrated of order one, *I(1)*, and the stochastic error term in [3.19] is integrated of order zero, *I(0)*; then LREXP and LRGDP are said to be cointegrated and there must be either a unidirectional or bi-directional Granger causal relationship between them (Granger, 1988). If these variables are cointegrated by either ADF or Johansen-Juselius procedure or both, then an error-correction representation must exist (Engle and Granger, 1987), and has the following form:

$$\Delta x_t = \alpha_1 e_{t-1} + \sum_{i=1}^{k} \phi_i \Delta x_{t-i} + \sum_{j=1}^{k} \delta_j \Delta y_{t-j} + \varepsilon_{1t}$$
$$\Delta y_t = \alpha_2 e_{t-1} + \sum_{i=1}^{k} \rho_i \Delta x_{t-i} + \sum_{j=1}^{k} \gamma_j \Delta y_{t-j} + \varepsilon_{2t} \qquad [3.21]$$

In the equation [3.21] above, the two variables x_t and y_t are cointegrated when at least one of the coefficients α_1 or α_2 is not zero. If $\alpha_1 = 0$ and $\alpha_2 \neq 0$, then x_t will lead y_t in the long run. Likewise, if $\alpha_1 \neq 0$ and $\alpha_2 = 0$, then y_t will lead x_t in the long run. On the other hand, the movements in y_t will lead those in x_t in the short run if the δ_js are not all zero. Also, if the ρ_is are not all zero, the movements in x_t will lead the movements in y_t in the short run.

For testing the cointegrating rank (which is the number of cointegrating vectors in the model), there are two tests originally proposed by Johansen, the first is the *maximum eigenvalue test* and the second is the *trace statistic test.* The former is to test the null hypothesis of *r* cointegrating vectors against the alternative of *r + 1* vectors. This test uses the $r + 1^{st}$ largest eigenvalue in the likelihood ratio:

$$\lambda\, max = -\, T \ln (1-\lambda_{r+1}) \qquad [3.22]$$

The latter is used in the following formula to test a more general alternative hypothesis with $r \leq n$:

$$\lambda_{trace} = -T \sum_{i=r+1}^{n} \ln(1 - \lambda_i) \qquad [3.23]$$

Of these two tests, the maximum eigenvalue test is expected to offer a more reliable inference as compared to the trace statistic test (Johansen and Juselius, 1990).

3.4.4 Error Correction Model

The ECM was first introduced by Sargan (1964) and has been dynamically revived due to the recent work of Granger (1986, 1988) and Engle and Granger (1987) on cointegration. By definition, an error-correction model is a dynamic model in which the movement of the variables in any periods is related to the previous period's gap from long-run equilibrium. Its major convenience is to join the two different characteristics of short-run dynamics and long-run relationship into the same system. As mentioned above, if two variables are cointegrated, there exists a long-run Granger-causality from at least one direction. However, a lack of cointegration does not rule out the short-run dynamics and Granger causality. It is also worth noting that the error-correction term should be removed from the equation [3.20] for the purpose of detecting Granger-causality between two variables if there is no long-run relationship between them (Bahmani and Payesteh, 1993).

Testing for causality is performed within the VAR models of different specifications. There are several cases as stated by Konya (2004a: 82):

- if both the time series are *I(0)*, a VAR model in levels is used;
- if one of the series is *I(0)* and the other one is *I(1)*, then VAR is specified in the level of the *I(0)* variable and in the first difference of the *I(1)* variable;
- if both the series are *I(1)* but not cointegrated, then VAR is the appropriate model in terms of the first differences; and
- if both the series are cointegrated, then a VAR model in levels is applied.

and:

> The weakness of this strategy is that incorrect conclusions drawn from preliminary analyses might be carried over onto the causality tests. In the light of the unit root and cointegration test results, this possibility must be taken seriously. The ambiguities of pre-testing might have great impact on the final conclusions regarding Granger-causality, unless different VAR specifications lead to the same results.

However, Toda and Yamamoto (1995) have overcome this problem by introducing a new technique, which does not rely a great deal on pre-testing, although still requiring the knowledge of the maximum order of integration and the lag structure. This technique is based on the following VAR system:

$$y_t = \alpha_1 + \sum_{i=1}^{mlag} \beta_{1i} y_{t-i} + \sum_{i=1}^{mlag} \gamma_{1i} x_{t-i} + \varepsilon_{1t} \qquad [3.24]$$

$$x_t = \alpha_2 + \sum_{i=1}^{mlag} \beta_{2i} y_{t-i} + \sum_{i=1}^{mlag} \gamma_{2i} x_{t-i} + \varepsilon_{2t}$$

where y_t and x_t are assuming stationarity, whether they are in levels or differencing in first (or higher) order of LREXP and LRGDP respectively, and that ε_{1t} and ε_{2t} are white-noise disturbances.

According to Konya (2004b), the test proposed by Toda and Yamamoto (1995) is a modified Wald (MWald) test for linear restrictions on some parameters of an augmented VAR *(mlag + d)* in levels, where *d* is the highest order of integration suspected in the system, usually at most two. In the bivariate case, this model without deterministic trend can be written as:

$$y_t = \alpha_1 + \sum_{i=1}^{mlag} \beta_{1i} y_{t-i} + \sum_{i=mlag+1}^{mlag+d} \beta_{1i} y_{t-i} + \sum_{i=1}^{mlag} \gamma_{1i} x_{t-i} + \sum_{i=mlag+1}^{mlag+d} \gamma_{1i} x_{t-i} + \varepsilon_{1t} \qquad [3.25]$$

$$x_t = \alpha_2 + \sum_{i=1}^{mlag} \beta_{2i} y_{t-i} + \sum_{i=mlag+1}^{mlag+d} \beta_{2i} y_{t-i} + \sum_{i=1}^{mlag} \gamma_{2i} x_{t-i} + \sum_{i=mlag+1}^{mlag+d} \gamma_{2i} x_{t-i} + \varepsilon_{2t}$$

3.4.5 Granger Causality

A test for Granger causality is a technique for determining whether one time series is useful in forecasting another. By definition, a time series x_t is said to Granger-cause y_t if it can be shown, usually through a series of *F*-tests on lagged values of x_t, that lagged x_t values provide statistically significant information about y_t. If x_t does not improve the forecasting performance of y_t, then x_t does not Granger-cause y_t.

In other words, the Granger-causality test enables us to detect statistically the existence and direction of causality (cause and effect) between two variables. The concept of Granger causality is based on the simple idea that a cause is always

followed by an effect, and that a cause cannot come after its effect. More specifically, it can be stated as follows: variable X is said to Granger-cause Y if variable Y is better predicted by including the past values of X rather than not including them. Likewise, if the past values of Y can be used to predict X more precisely than using only the past values of X, then Y is said to Granger-cause X. Finally, if X and Y are Granger-causing each other, then this relationship is called a 'feedback' or a bi-directional causality.

The test works by first regressing Δy_t on lagged values of Δy_t. If the results show that the *t*-statistic (or *p*-value) from the appropriate lag interval for y_t is significant, then subsequent regressions for lagged levels of Δx_t are performed and added to the regression, provided that: 1) results are significant within the system, and 2) explanatory power of the model is improved. This can be repeated for Δx_t's (with each Δx_t being tested independently of other Δx_t's, but in conjunction with the proven lag level of Δy_t). The regression model can be added with more than one lag level of a variable, provided it is statistically significant and provides explanatory power.

There are various ways to apply a test of Granger causality. One of the simple approaches is to use the autoregressive specification of a bivariate vector autoregression. Assume a particular autoregressive lag length *k*, and estimate the following unrestricted equation by ordinary least squares (OLS):

$$x_t = c_1 + \sum_{i=1}^{k} \alpha_i x_{t-i} + \sum_{i=1}^{k} \beta_i y_{t-i} + \varepsilon_t \qquad [3.26]$$

The null and alternative hypotheses are:

$$H_0 : \beta_1 = \beta_2 = \ldots = \beta_k = 0$$

H_A = at least one coefficient is not zero.

We can use the OLS to conduct an *F*-test of the null hypothesis by estimating the following restricted equation:

$$x_t = c_t + \sum_{i=1}^{k} \gamma_i x_{t-i} + e_t \qquad [3.27]$$

Compare their respective sum of squared residuals.

$$RSS_1 = \sum_{t=1}^{T} \hat{u}_t^2 \qquad RSS_0 = \sum_{t=1}^{T} \hat{e}_t^2 \qquad [3.28]$$

If the test statistic

$$S_1 = \frac{(RSS_0 - RSS_1)/k}{RSS_1/(T-2k-1)} \approx F_k, T-2k-1 \qquad [3.29]$$

is greater than the specified critical value, then we reject the null hypothesis that y_t does not Granger-cause x_t.

It is noted that Granger-causality tests are very sensitive to the choice of lag length, and to the methods employed in dealing with any non-stationary variables. With respect to lagged dependent variables as in Granger-causality regressions, the test is valid only asymptotically. An asymptotically equivalent test is given by the following equation:

$$S_1 = \frac{T(RSS_0 - RSS_1)}{RSS_1} \approx X^2(k) \qquad [3.30]$$

3.4.6 Data

All the data used in this chapter, real GDP and real exports of goods and services at constant prices (base year 2000), are collected from the World Bank database. According to the World Bank's definition: 'Constant prices are obtained by directly factoring changes over time in the values of flows of goods and services into two components reflecting changes in the prices of the goods and services concerned and changes in their volumes' (i.e. changes in 'constant price terms'). Constant prices at a base year mean that the volume of goods and services are measured in the prices of a common base year.

Although the ASEAN-4's data are available from the 1950s, we selected 1970 to 2006 for this study, as these countries have changed from import-substitution to export-oriented strategy from the beginning of the 1970s. Meanwhile, the time series for Vietnam is available only from 1989 to 2006. In addition, it is noteworthy to mention that Vietnam's trade data before 1990 seem unreliable because of a barter trade system with the Council for Mutual Economic Assistance (CMEA) countries and a

fixed exchange rate regime pegged to the former Soviet Union's currency until the end of the 1990s.[23]

Also, it is noted that the analysis uses annually data because quarterly data are not available.

The software used for running all these tests is Eviews 6.1. Lastly, it is noted that the definition of the variables in this analysis is as follows:

LRGDP = the natural log of real GDP (RGDP)
LREXP = the natural log of real EXP (REXP)

However, for simplicity, we sometimes use GDP and EXP for the natural logs of RGDP and REXP in some tables presented throughout this chapter.

[23] Also, there are significant differences between official Vietnamese import figures and the figures collected from Vietnam's trade partners. According to a Vietnamese expert on trade statistics, these differences are caused by two main factors: (1) the undervaluation of imports to avoid tariffs, and (2) the government has been excluding capital goods imports relating to foreign direct investment projects. If these differences are taken into account, probably a higher proportion of consumer goods will be reflected in Vietnam's import commodity structure (Ebashi, 1997: 54).

3.5 Empirical Results

3.5.1 Results of Unit Root Test

Table 3.2 presents the results of the unit root test. Evidently, each time series is non-stationary at the 0.05 significant level. However, they all become stationary after their first difference.

Table 3.2: ASEAN-5's Unit Root Test Results for Logs of REXP and RGDP

		Augmented Dickey Fuller Test		Phillips-Perron Test	
		Trend & Intercept		Trend & Intercept	
Variable	Level/ Difference	*Test statistic*	*p-value*	*Test statistic*	*p-value*
		Indonesia			
LREXP	Level	-2.386 (0)	0.3800	-2.567(3)	0.2963
	1st Difference	-6.203 (0)	0.0001	-6.208 (2)	0.0001
LRGDP	Level	-1.491 (1)	0.8137	-1.144 (1)	0.9068
	1st Difference	-4.485 (0)	0.0055	-4.457 (2)	0.0067
		Malaysia			
LREXP	Level	-1.280 (2)	0.8761	-1.993 (2)	0.5852
	1st Difference	-5.523 (0)	0.0004	-5.518 (1)	0.0004
LRGDP	Level	-1.635 (0)	0.7588	-1.794 (2)	0.6868
	1st Difference	-5.026 (0)	0.0014	-5.038 (1)	0.0013
		Philippines			
LREXP	Level	-2.654 (0)	0.5232	-2.681 (2)	0.2498
	1st Difference	-6.089 (0)	0.0001	-6.137 (2)	0.0001
LRGDP	Level	-1.836 (0)	0.6660	-2.142 (2)	0.5057
	1st Difference	-3.216 (0)	0.0274	-3.241 (2)	0.0259
		Thailand			
LREXP	Level	-1.252 (0)	0.8837	-1.475 (2)	0.8197
	1st Difference	-5.656 (0)	0.0003	-5.688 (2)	0.0002
LRGDP	Level	-1.437 (2)	0.8312	-1.161 (3)	0.9036
	1st Difference	-3.403 (0)	0.0673*	-3.396 (2)	0.0683*
		Vietnam			
LREXP	Level	-1.650 (0)	0.7284	-1.623 (1)	0.7397
	1st Difference	-4.433 (0)	0.0151	-4.760 (3)	0.0085
LRGDP	Level	-1.324 (0)	0.8455	-1.790 (2)	0.6644
	1st Difference	-2.982 (0)	0.0596*	-2.928 (2)	0.0655*

Notes: The numbers in parentheses for the ADF represent the number of lags of the dependent variables included in the test. The numbers in parentheses for the PP indicate the number of Newey-West bandwidth (using Bartlett kernel) automatically selected by the system.
* Significant at the 0.10 level, otherwise significant at the 0.05 level.

3.5.2 Results of Cointegration Test

Having confirmed each time series on LRGDP and LREXP of the ASEAN-5 is stationary after first differencing; the next step is to apply the Engle-Granger two-step cointegration procedure and the Johansen-Julelius cointegration test to check whether the two variables are cointegrated for each country concerned. At first, the ADF procedure is applied. The cointegration results based on this technique are reported in Table 3.3.

Table 3.3: Cointegration Tests Based on Engle-Granger Procedure

Dependent (y_t)	Independent (x_t)	Engle-Granger Statistics	CRDW Statistics	Adj R^2
		Indonesia		
RGDP	REXP	-2.746 (9)	1.992	0.12
		Malaysia		
RGDP	REXP	-3.122 (0)	1.575	0.20
		Philippines		
RGDP	REXP	-2.325 (0)	1.816	0.11
		Thailand		
RGDP	REXP	-2.202(0)	1.931	0.10
		Vietnam		
RGDP	REXP	-2.198 (0)	1.931	0.19

Notes: The critical values of ADF statistic are -3.63, -2.95 and -2.61 at 1%, 5% and 10% significant level respectively by MacKinnon (1996). The numbers in parentheses represent the number of lags of the dependent variables included in the test.

Taking the Engle-Granger statistic values in comparison with the critical values at the bottom of the table, while the two variables RGDP and REXP are cointegrated at 10 per cent and higher levels of significance for Indonesia and Malaysia; the cointegration process appears not to exist for the Philippines, Thailand and Vietnam. Although the ADF test is more powerful than the CRDW, Engle and Granger (1987) point out that the CRDW statistic can be used to indicate white noise and also for quick approximate results. The CRDW statistic must be significantly different from zero for the residuals of cointegration equations to be stationary. The results somewhat confirm the CRDW statistics of all the ASEAN-5 are statistically significant, even in the case of the Philippines, Thailand and Vietnam, whose t-statistics are not supported by the ADF test. The value of adjusted R^2 attached in the table indicates the relative strength of a long-run association between the two variables. On the other hand, the absence of cointegration means that the two variables are moving independently of each other without any tendency to converge in

the long run. The figures in parentheses are the optimal lag length for the ADF statistic. The optimal lag length in this analysis has been determined by the Akaike final prediction error (FPT) criterion.

The Johansen-Juselius procedure is used next to surmount some contradiction rising from both the ADF and CRDW tests above, as well as to establish whether or not the two variables share a common stochastic trend. Obviously, the results from λ_{max} and λ_{trace} in Table 3.4 below prove that the null hypothesis of no cointegration between RGDP and REXP is rejected at the 95 per cent confident level for all the ASEAN-5. In other words, both the maximum eigenvalue and trace tests confirm one cointegrating vector for all the ASEAN-5 countries at 0.05 significant level. According to the Granger representation theorem (Engle-Granger 1987), a system of cointegrated variables has an error-correction representation that combines the short-run dynamics of the variables with their long-run association as implied by the cointegrating relationship. As mentioned earlier, if two variables are cointegrated, then there exists a long-run Granger-causality from at least one direction. In order to determine the direction of causality between RGDP and REXP, the error-correction model is employed and its results are reported in the next section.

Table 3.4: Cointegration Tests Based on Johansen-Juselius Procedure

Data Vector	Hypothesised No. of CE (s)	λ_{max}	p-value	λ_{trace}	p-value
		Indonesia			
(RGDP, REXP)	None*	37.147	0.0001	49.192	0.0000
	At most 1	12.045	0.0599	12.045	0.0599
		Malaysia			
(RGDP, REXP)	None*	28.730	0.0035	38.709	0.0008
	At most 1	9.980	0.1281	9.980	0.1281
		Philippines			
(RGDP, REXP)	None*	29.398	0.0013	40.130	0.0005
	At most 1	10.732	0.0976	10.732	0.0976
		Thailand			
(RGDP, REXP)	None*	19.593	0.0467	26.530	0.0414
	At most 1	6.937	0.3511	6.937	0.3511
		Vietnam			
(RGDP, REXP)	None*	22.303	0.0183	31.165	0.0100
	At most 1	8.862	0.1890	8.862	0.1890

Note: * denotes rejection of the hypothesis at the 0.05 significant level.

3.5.3 Results of Error-Correction Model

The error-correction model in the equation [3.20] is estimated to find the values of α_1 and α_2 for the long-run relationship, and the values of δ_j and ρ_i for the short-run dynamics nature of the two variables. The tests have been tried by various lagged differences of both variables for the optimal statistically significance of those coefficients. The *F*-statistics values for short-run dynamics are obtained by the Wald test with alternative hypothesis that the δ_js are not all zero for RGDP → REXP, and conversely the ρ_is are not all zero for REXP → RGDP.

The results reveal that bidirectional Granger-causality exists in the short run for Malaysia, Philippines, Thailand and Vietnam while there is unidirectional Granger-causality from real GDP growth to real EXP growth for Indonesia. The long-run relationship, represented by the EC-term *T*-statistics in the last column shows a bidirectional Granger-causality between real GDP growth and real EXP growth for Malaysia and Thailand, while real GDP growth Granger-caused real EXP growth for Indonesia and an inverse relationship exists between these two variables for the Philippines and Vietnam. Tables 3.5 and 3.6 below present the ASEAN-5's results of the error-correction model.

Table 3.5: Results of Error-Correction Model

Dependent Variable	Independent Variable	F-Statistics	$\overline{R^{2(*)}}$	EC-Term T-Statistics
		Indonesia		
RGDP	REXP	0.375 (3, 29)	0.09	-0.290
REXP	RGDP	5.285 (3, 29)	0.34	-1.290
		Malaysia		
RGDP	REXP	14.142 (2, 31)	0.46	-2.619
REXP	RGDP	15.437 (2, 31)	0.46	-2.302
		Philippines		
RGDP	REXP	11.202 (2, 31)	0.43	-2.665
REXP	RGDP	12.407 (2, 31)	0.39	-1.836
		Thailand		
RGDP	REXP	9.681 (3, 29)	0.45	-2.122
REXP	RGDP	5.109 (3, 29)	0.35	-3.710
		Vietnam		
RGDP	REXP	12.623 (3, 10)	0.84	2.420
REXP	RGDP	3.279 (3, 10)	0.45	-1.870

Notes: All tests are based on 0.05 significant level. The numbers in parentheses represent the degree of freedom of F-statistics test.
* indicates the relative strength of causality between the variables.

Table 3.6: Summary of Empirical Analysis of ASEAN-5's Granger-Causality, Using Error-Correction Model

	Ho: Unit Root/ Order of Integration	Cointegration		Causality	
		ADF	Johansen-Juselius	Short-Run	Long-Run
Indonesia	Ho: cannot reject I (1)	Cointegration	Cointegration	EXP ← GDP	No Causality
Malaysia	Ho: cannot reject I (1)	Cointegration	Cointegration	EXP ↔ GDP	EXP ↔ GDP
Philippines	Ho: cannot reject I (1)	No-cointegration	Cointegration	EXP ↔ GDP	EXP → GDP
Thailand	Ho: cannot reject I (1)	No-cointegration	Cointegration	EXP ↔ GDP	EXP ↔ GDP
Vietnam	Ho: cannot reject I (1)	No-cointegration	Cointegration	EXP ↔ GDP	EXP → GDP

To ensure the test results of the ASEAN-5's causality analysis above are reliable, we double-check these results with those of the pair-wise Granger-causality test. However, there is an important issue to be addressed regarding this pair-wise Granger-causality test as stated by Konya (2000: 89):

> Since the lag length is typically unknown, it has to be specified in one way or another. This is a crucial step since too few lags result in specification error and incorrect conclusions, while too many lags waste observations and decrease the degree of freedom. There are several possible approaches. Lutkepohl (1993: 306) suggests linking the lag length (*mlag*) and the number of endogenous variables in the system *(m)* to the sample size (*T*) according to the $m*mlag = T^{1/3}$ formula.

This means the maximal lag length for the ASEAN-5's sample size is between 1-3 periods for a bivariate system. The feature of Eviews used for these tests includes various model specification criteria such as the likelihood ratio (LR), the final prediction error (FPE), the Akaike information criterion (AIC), the Schwarz information criterion (SC), and lastly the Hannan-Quinn information criterion (HQ). The lag lengths selected by these criteria in the test, certainly vary from case to case. However, our preference will be given to the majority selected by those abovementioned criteria. Since our sample size is relatively small (only for Vietnam); the maximum lag length that we specify in the selection process selected by those criteria is 3 periods. Also, since the Granger-causality test is very sensitive to the lag structure, our preference is given to the more stable outcome.

The following Table 3.7 shows the results of ASEAN-5's pair-wise Granger-causality tests.

Table 3.7: Results of ASEAN-5's Pair-wise Granger-Causality Tests

Null Hypothesis	Obs.	No. of Criteria Selected (*)	Lag Selected	*F*-Statistic	*p*-value	Conclusion
Indonesia (a)						
GDP does not Granger Cause EXP	34	5	2	5.8921	0.0069	EXP ← GDP
EXP does not Granger Cause GDP	34	5	2	0.3853	0.8532	
Malaysia (b)						
GDP does not Granger Cause EXP	35	5	1	1.5455	0.2228	No causality
EXP does not Granger Cause GDP	35	5	1	1.0063	0.3233	
Philippines						
GDP does not Granger Cause EXP	32	5	3	1.5174	0.2325	EXP → GDP
EXP does not Granger Cause GDP	34	5	3	4.2921	0.0134	
Thailand						
GDP does not Granger Cause EXP	33	3	3	3.6937	0.0244	EXP↔ GDP
EXP does not Granger Cause GDP	33	3	3	4.8840	0.0080	
Vietnam						
GDP does not Granger Cause EXP	16	3	2	1.8690	0.2001	EXP → GDP
EXP does not Granger Cause GDP	16	3	2	7.9100	0.0074	

Notes: (*) (1) LR: sequential modified LR test statistic (each test at 5% level); (2) FPE: Final prediction error; (3) AIC: Akaike information criterion; (4) SC: Schwarz information criterion; and (5) HQ: Hannan-Quinn information criterion.

(a) Strong causality runs from GDP to EXP for Indonesia as none of the lags selected from lag 1 to 10 shows a reverse relationship.

(b) None of lag 1 to 10 shows a causal relationship between EXP and GDP for Malaysia.

Having determined the long-run Granger causality of the ASEAN-5 by the error correction model and pair-wise Granger tests, we detect the following:

- *Indonesia*: no causality in error correction model but unidirectional causality in pair-wise Granger test flows from GDP to EXP;
- *Malaysia:* bidirectional causality in error correction model but no causality in pair-wise Granger test; and
- *The Philippines, Thailand, and* Vietnam: results remain unchanged.

The contradictory results for Indonesia and Malaysia in two different types of tests induce us to employ another technique, the Impulse Response Function (IRF) in the vector autoregressive model (VAR) as a complementary measure to resolve this problem.

3.5.4 Impulse Response Function

The Granger-causality method can be used to identify the causal relationship between two (or more) variables in a bivariate (or multivariate) system; however it may not tell us anything about the interactions between these variables. Therefore, it is often of interest to know the response of one variable as a consequence of an impulse to another variable in a system that involves two or more variables. Generally speaking, if there is a reaction of one variable due to the impulse of another one, then the latter is a cause and the former is an effect. We can identify this type of causality by tracing out the effect of an exogenous shock or innovation in one of the variables on some or all of the other variables. This type of causality analysis is called Impulse Response Function. The IRF is used via a VAR representation to analyse the dynamic effects of the impact of unitary shocks on the macroeconomic variables under consideration. The mathematical representation of the VAR is introduced in the following equation.

$$\Delta y_t = \alpha \Delta y_{t-1} + \ldots + \alpha_i \Delta y_{t-i} + \beta \Delta x_t + \varepsilon_t \qquad [3.31]$$

where y_t is a k vector of exogenous variables, x_t is a vector of endogenous variables, α, α_i, β are matrices of coefficients to be estimated, and ε_t is a vector of innovations that may be contemporaneously correlated, but is uncorrelated with its own lagged values, and is independent from all of the right-hand side variables (it is LREXP in this case). The VAR approach is applied as it considers every endogenous variable in the system as a function of the lagged values of themselves, and allows a generation of impulse response function.

The IRF is defined by the following equations:

$$y_{t+n} = \sum_{t=0}^{\infty} \psi_i \Phi_{t+n-i} \qquad \{\Psi_n\}_{i,j} = \frac{\partial y_{it+n}}{\partial \Phi_{jt}} \qquad [3.32, 3.33]$$

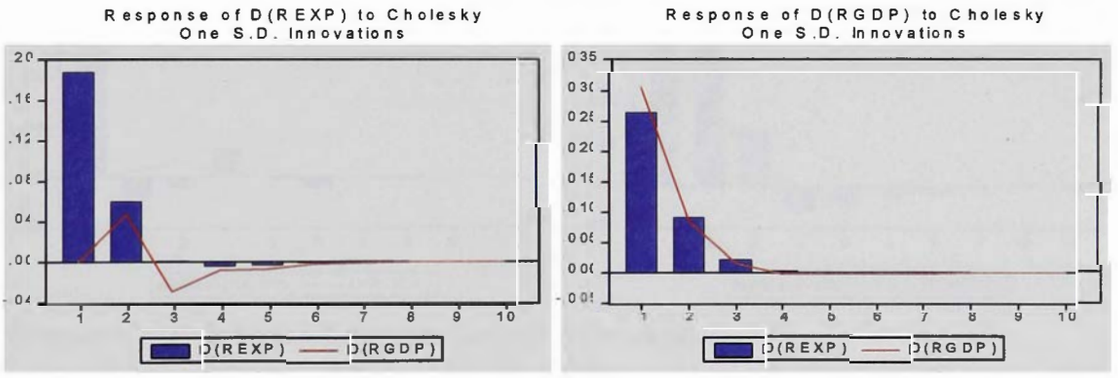
It measures the response of $y_{i,\,t+n}$ to a one-time impulse in $y_{j,t}$ with all other variables dated t or earlier is held constant. The response of variable i to a unit shock in variable j can be graphically demonstrated to get a visual impression of the dynamic relationship within the system. The impulse response has a value of zero if one of the variables does not Grange-cause the other in the system. More specifically, an innovation of variable i has no effect on the other variables if the former variable does

not Granger-cause the remaining ones. A problematic assumption in this type of impulse response analysis is that a shock occurs only in one variable at a time. Such an assumption may be reasonable if the shocks in different variables are independent. However, our analysis in this study involves only two variables, log of real EXP and log of real GDP, thus this kind of problem does not exist and the methods to deal with such circumstances should not be mentioned here.

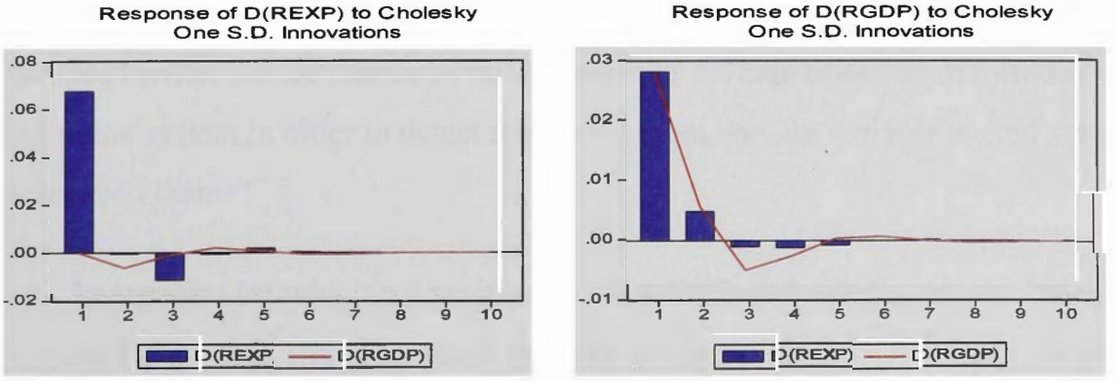
The generalised IR from an innovation to the j^{th} variable is obtained by applying a variable specific Cholesky factor computed with the j^{th} variable at the top of the Cholesky ordering. Plotting the impulse response function is a practical way to visually represent the behaviour of real exports and real GDP in response to various shocks caused by one of them. Figure 3.2 below shows the generalised impulse response functions for the ASEAN-5. Each graph presents the response for each endogenous variable in the system, for a shock caused by the other variable in the model.

Figure 3.2: ASEAN-5's Impulse Response Function

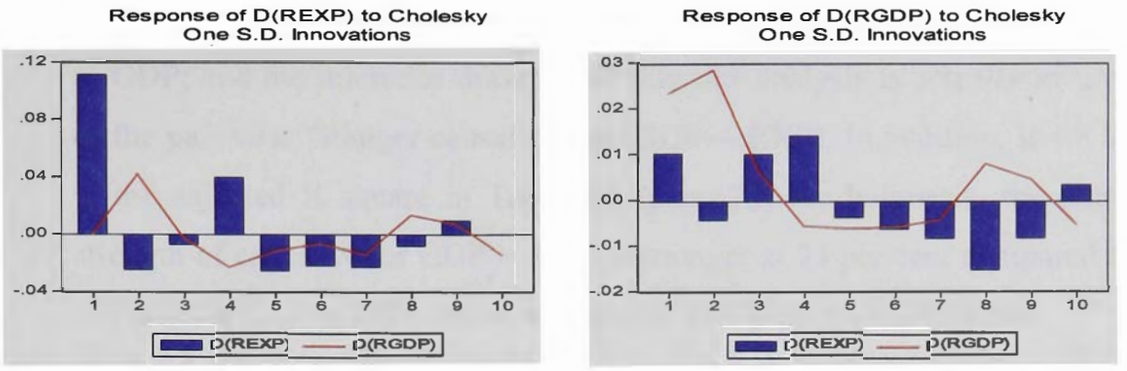
Indonesia



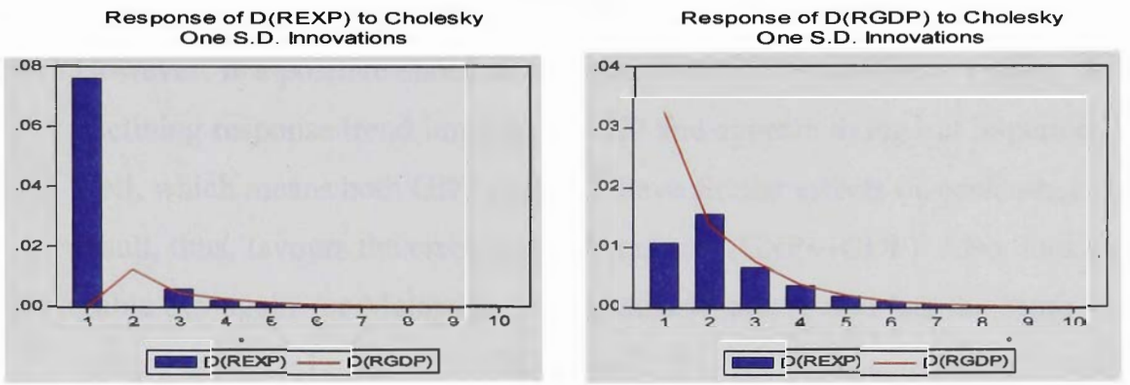
Malaysia



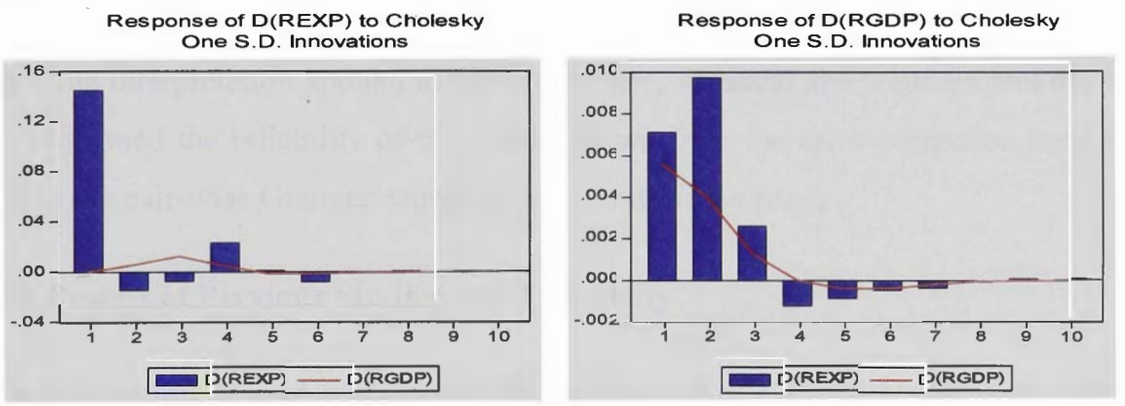
Philippines



Thailand



Vietnam



Note: Output of ASEAN-5's impulse response function by Eviews 6.1.

Now we focus our interpretation on Indonesia and Malaysia to resolve the contradictory results of Granger-causality arising from the previous section. As mentioned earlier, we are interested in investigating the consequences of introducing a shock to the system in order to detect a response from another variable to find a causal link between them.

- **Indonesia:** Introducing a positive shock to EXP (left-hand graph for Indonesia in Figure 3.2), we observe a positive response from GDP, which dies out between period 2 and 3. On the other graph, if we induce a positive shock to

GDP, then EXP responds positively and its effect vanishes in period 4. This implies that the shock has a stronger impact from GDP to EXP than from EXP to GDP; and the inference drawn from this IRF analysis is actually in favour of the pair-wise Granger causality test (GDP→ EXP). In addition, if we look at the adjusted R square in Table 3.5 (page 75) for Indonesia, the relative strength of causality for GDP→ EXP is stronger at 34 per cent compared to 9 per cent for EXP→ GDP. Now, we turn our IRF analysis to Malaysia.

- **Malaysia:** Introducing a positive shock to EXP, a negative response from GDP follows and becomes extinct in period 3 (left-hand graph for Malaysia). However, if a positive shock is introduced to GDP (right-hand graph), then a declining response trend impacts on EXP and appears dying out in period 3 as well, which means both GDP and EXP have similar effects on each other. This result, thus, favours the error-correction model (EXP↔GDP). Also, looking at Table 3.5 again for Malaysia, the adjusted R square that has the same value (46 per cent) for both EXP→ GDP and GDP→ EXP, indicates that the relative strength of causality between these two variables is equal.

The same interpretation applied to the Philippines, Thailand and Vietnam and the IRF has confirmed the reliability of the results drawn from the error-correction model as well as the pair-wise Granger causality tests for these countries.

3.5.5 Results of Previous Studies and This Study

This sub-section is used to compare the results of our study with those of previous ones on the ASEAN-4, which are summarised in Table 3.8 below. Our findings to some extent are very similar to those of Rahman and Mustafa's study (1997) for Indonesia, Malaysia and the Philippines on both short-and long-run relationship, and for Thailand on short-run dynamics. It is noteworthy that, while our analysis is based on the cointegration technique, error-correction model, pair-wise Granger causality test and impulse response function for the annual time series from 1970 to 2006 (37 observations) for the ASEAN-4 and 18 observations for Vietnam (1989-2006), Rahman and Mustafa's study was based on the same cointegration and error-correction procedures and their annual time series for the ASEAN-4 was about 20 observations (time-series period not specified).

This study's results are also similar to those of Bahmani-Oskooee and Alse (1993), of Xu (1996) and of Ekanayake (1999) for Thailand; of Ahmad and Harnhirum (1996) for Indonesia; of Baharumshah and Rashid (1999), and recently of Furuoka (2007) and Mahadevan (2007) for Malaysia; of Dutt and Ghosh (1996) and Xu (1996) for the Philippines.

The presentation of Table 3.8 is used only as a measure of relative comparison between some of the previous studies and our current one. It does not state correctness of each, as the coverage of each study is different in many aspects such as time series period, frequency of time series (annual, quarterly, monthly data), bivariate/multivariate system, and technique and test specifications etc. applied in the analysis.

In general, the main reason for so different results between this study and the previous ones obviously is the time series periods, which in most of other studies start from the 1950s and 1960s in cross-country analysis involving many developing countries. Nevertheless, we are confident with our results given from this wide-ranging analysis that yield reliable outcomes because, with the exception of short time series for Vietnam, the time series for the ASEAN-4 are long enough (longer than some other studies); and covers the whole period (1970-2006) when these countries changed from inward-looking import-substitution to outward-looking export-oriented policy. With respect to a bivariate model comprising exports and output growth, the omission of the services sector in a country's economic development as in many of previous studies is a drawback in producing reliable results. Also, the additional application of the impulse response function to supplement the error correction model and pair-wise Granger-causality in the analytical process ensures the accuracy and reliability of our study.

It should be emphasised here that, the use of consumer price index as deflator to obtain real exports as in some other studies is an imprecise practice, and thus generate inaccurate biased results. The reason is as defined by the UN Comtrade database: 'the consumer price index measures the percentage changes from a base year in the cost of purchasing a constant basket of goods and services representing the purchases by a

particular population group in a specified time period. It reflects price movements of some 300 items', and many of them are non-export items.

Also, it is worth to note that the definition of macroeconomic long run and short run is not as the way Al-Yousif (1999: 71) states that long run is 'two years or more'. The macroeconomic long run is a period that is long enough so that businessmen have complete information about price levels, contracts based on old price levels expire, and expectations are fully adapted to the new situation.[24] Conversely, the macroeconomic short run is a period that is short enough so that businessmen believe it is profitable to increase output when the price level is higher than they had expected, either because they have incomplete information about relative prices or because contracts for inputs at the old price level are still in force.

Briefly speaking, in the case of Vietnam, we are 95 per cent confident to reject the null hypothesis of GDP growth does not Granger-cause export growth, and of export growth does not Granger-cause GDP growth in the short run, which means there is a feedback relationship. As for the long run, with the same confident level, we reject the null hypothesis that exports growth does not Granger-cause GDP growth. In other words, the expansion of exports is really an engine of growth in Vietnam's economic development.

It is noted that these conclusions are based on Vietnam's data limitations collected for this study from the World Bank database.

[24] According to this definition, more than thirty years after Doi-Moi, many businessmen in Vietnam still have not equipped enough knowledge about business skills in dealing with foreign partners, or complete information about price levels in foreign markets etc. as they are not ready to fully adapt to the new situation when Vietnam opened its doors to the global trading network in 1986.

Table 3.8: Comparative Observation of Previous Studies and this Study

						Indonesia		Malaysia		Philippines		Thailand		Vietnam	
	Time-Series	**Country**	**Model**	**Methodology**	**Variables**	**S-R**	**L-R**	**S-R**	**L-R**	**S-R**	**L-R**	**S-R**	**L-R**	**S-R**	**L-R**
Lam 2009 (this study)	*1970-06* [c]	*ASEAN-5*	*Bivariate*	*ADF, PP / EG-ADF, JJ / ECM, PW, IRF*	*GDP, EXP of goods & services*	**GLE**	**GLE**	**BDC**	**BDC**	**BDC**	**ELG**	**BDC**	**BDC**	**BDC**	**ELG**
Mahadevan (2007)	*1974-03*	*Malaysia (1)*	*Multivariate*	*ADF, KPSS / MWald*	*EXP, IMP, GDP, trade-adjusted GDP, TFP, LP,*				**BDC** [b]						
Furuoka (2007)	*1970-04*	*Malaysia (1)*	*Bivariate*	*ADF / JJ / VECM*	*EXP, GDP*			GLE	**BDC**						
Amrinto (2006)	*1981-04*	*Philippines (1)*	*Multivariate*	*PP / EG-ADF / VECM*	*EXP (goods & services), GDP, ER, CAP*					**BDC**	BDC				
Keong, Yusop & Liew (2005)	*1960-01*	*Malaysia (1)*	*Multivariate*	*ADF, PP / ARDL*	*EXP, IMP, GDP, LF, ER*			ELG	ELG						
Ekanayake (1999)	*1960-97*	*7*	*Bivariate*	*ADF / EG-ADF, JJ /. VECM*	*EXP, GDP*	ELG	BDC	GLE	ELG	GLE	BDC	GLE	**BDC**		
Baharumshah & Rashid (1999)	*1970-94*	*Malaysia (1)*	*Multivariate*	*ADF, PP / JJ / VECM*	*EXP, GDP, AX, MX, IM*				**BDC**						
Al-Yousif (1999)	*1973-93*	*Malaysia (1)*	*Multivariate*	*ADF / WS / JJ / VECM*	*EXP, GDP,EI ,ER, CAP*			ELG	GLE						
Islam (1998)	*1967-91*	*15*	*Bivariate*	*ADF, JJ, VECM*	*EXP, GDP*		ELG		NC		NC		NC		
Rahman & Mustafa (1997)	*20 years* [a]	*13*	*Bivariate*	*ADF / EG-ADF, JJ / ECM*	*EXP, GDP*	**GLE**	**GLE**	**BDC**	**BDC**	**BDC**	**ELG**	**BDC**	ELG		
Ghatak, Milner & Utkulu (1997)	*1955-90*	*Malaysia (1)*	*Bivariate*	*ADF / JJ / VECM*	*EXP, GDP/EXP, non-EXP GDP*				ELG						
Xu (1996)	*1951-90*	*32*	*Bivariate*	*AD / EG-ADF / VECM*	*EXP, GDP*		ELG		ELG		**ELG**		**BDC**		
Piazolo (1996)	*1965-92*	*Indonesia (1)*	*Multivariate*	*ADF, PP /EG-ADF, JJ /VECM*	*EXP, GDP, GE, P, INV, INF, NFDI*		ELG								
Dutt & Ghosh (1996)	*1953-91*	*26*	*Bivariate*	*DF, PP /EG-ADF / VECM*	*EXP, GDP*						**ELG**		NC		
Ahmad & Harnhirum (1996)	*1966-88*	*5*	*Bivariate*	*ADF, JJ / ECM*	*(EXP, GDP) per capita*		**GLE**		GLE		GLE		GLE		
Bahmani-Oskooee & Alse (1993)	*1973-88*	*9*	*Bivariate*	*ADF / CRDW, DG-ADF /VECM*	*EXP, GDP*				NC		BDC		**BDC**		
Dodaro (1993)	*1967-86*	*87*	*Bivariate*	*OLS simple regression*	*Growth of (GDP, EXP of goods & non-factor services*		BDC		ELG		NC		NC		
Jung & Marshall (1985)	*1950-81*	*37*	*Bivariate*	*VARD*	*Growth of (GDP, EXP)*		ELG				NC		GLE		

Notes:

(1) SR = Short run; LR = Long run; ELG = Export-led Growth; GLE = Growth-led Export; BDC = Bidirectional Causality; NC = No-causality.

(2) Blank spaces indicate countries not included in the studies, and short- run results are not available in some studies.

(3) Bold words show similar results to this study.

(a) Rahman and Mustafa's study (1997) mentioned the time series of 20 years but not specified the time period;

(b) This result is based on Exports and Trade-adjusted GDP.

(c) Vietnam's data are from 1989 to 2006.

Methodology:

(1) Unit Root Test: ADF = Augmented Dickey Fuller; PP = Philips & Perron; WS = Weighted Symmetric; KPSS = Kwiatkowski-Phillips-Schmidt-Shin.

(2) Cointegration Test: EG-ADF = Engle-Granger Augmented Dicker Fuller; JJ = Johensen & Julius;

(3) Model: OLS = Ordinary Least Square; ECM = Error Correction Model; VECM = Vector Error Correction Model; ARDL = Autoregressive Distributed Lag;

MWald =Modified Wald test; VARD = First VAR Difference; $VARD^2$ = Second VAR Difference; PW = Pair-wise Granger-causality; IRF = Impulse Response Function.

Variables:

EI = Employment Index; EXP = Export; IMP = Import; LF = Labour Force; LP = Labour Productivity; TFP = Total Factor Productivity; ER = Exchange Rate; AX = Agricultural Exports; MX = Manufacturing Exports; CAP = Capital; GE = Government Expenditure; P = Population; INV = Investment; INF = Inflation; NFDI = Net Foreign Direct Investment.

3.6 Conclusion

This chapter applies the econometric techniques of cointegration, error-correction, pair-wise Granger causality and impulse response function to test the short-run dynamics as well as long-run causal relationship between exports growth and economic growth in Vietnam and the ASEAN-4. Apart from this analysis, there are a number of previous studies, which have performed this type of causality test for the ASEAN-4; however to the best of my knowledge, there is no similar study for Vietnam. This study, therefore, contributes significantly to the issue of causality between these two fundamental variables in the macro economy of Vietnam. It also contributes in part to the longstanding controversy of causality between trade and growth for the ASEAN-4, as well as in the literature of the export-led growth hypothesis.

It is of vital importance to define whether a country is in the process of ELG or GLE, or even a two-way causal relationship between trade and economic growth in order to guide policymakers in setting up appropriate strategies for that country's sustained high economic growth in the long run. If the ELG hypothesis is accepted, then the country should adopt the outward-looking export-oriented industrialisation strategy by promoting suitable policies to enhance trade. For example, a flexible foreign exchange rate policy, minimal direct import-control measures, low and effective protection rates, government subsidies for export industries, strong incentives for export-oriented industries, and efficient export and import procedures etc. On the other hand, if the GLE hypothesis is acknowledged, then the inward-looking development strategy may be essential to enhance the growth of output, and exports are just a vent for the country's expansion of commodity surplus. Policies for such situation as domestic market protection through import restrictions, high tariffs, overvalued currency, low interest financing, special incentives for infant industries etc. In the third case, a bi-directional causal relationship between these two variables exists, the suitable policies should be a balanced mixture of both strategies.

'Vietnam seems to have been pursuing an industrial development strategy that is a *mixture* of export orientation and import substitution' (Ebashi, 1997). This statement

strongly supports our econometric findings in this chapter of bidirectional causality between export growth and output growth for short run dynamics.

This study reveals that for short-run dynamics, while bi-directional Granger-causality exists in Malaysia, the Philippines, Thailand and Vietnam; the unidirectional Granger-causality runs from GDP growth to EXP growth for Indonesia. While the long-run relationship shows a bidirectional Granger-causality between GDP and EXP growth for Malaysia and Thailand, GDP growth Granger-caused EXP growth for Indonesia and an inverse relationship exists between these two variables for the Philippines and Vietnam (EXP→GDP). In the case of Vietnam, while the short-run bidirectional causality between exports growth and output growth is detected by the Wald tests of vector-autoregressive model, the long-run unidirectional relationship from exports to output growth is determined by all three different techniques, the error correction model, the pair-wise Granger causality test and the impulse response function in vector-autoregressive model.

Briefly, it can be said in other words that, with the exception of Indonesia, the export-led growth hypothesis for Vietnam is analogous to that of the second-tier NICs of Malaysia, the Philippines and Thailand, and that exports are really an engine of growth enhancing Vietnam's GDP growth over the period studied (1989-2006) and in the long run. More specifically, exports are a determinant foundation for Vietnam's economic growth as in the case of Malaysia and Thailand in short run dynamics and as the Philippines in the long run.

Generally, the policy implications for these empirical findings suggest the following.

- *Indonesia*: the increase of exports is only an effect of the country's expansion of output; therefore Indonesia should fasten further weight on higher economic growth policy by using the inward-looking industrialisation strategies to meet the growing domestic demand.
- *Malaysia and Thailand*: the long run relationship is mutually reinforcing of each other between exports and output growth; therefore Malaysia and Thailand should focus with the same magnitude on higher economic growth

for both domestic demand and foreign markets by using a mixture of strategies of export promotion as well as import substitution industrialisation.

- *Vietnam and the Philippines*: the expansion of exports is really a cause for these two countries' output growth; Vietnam and the Philippines thus should keep concentrating on the export-promotion industrialisation strategies, as well as improving the diplomatic and trade relations with countries all over the world and integrating more to the global trading network.

The role of trade has been recognised by vast literature in development economics. Indeed, as Balassa (1978, 1985) notes, exports lead to an improvement in economic efficiency by enhancing the degree of competition, and the production of exports that is concentrated in the most efficient sectors of the economy will promote a pattern of production that is consistent with a country's comparative advantage. Finally, specialisation in these export sectors also improves productivity in the economy leading to higher output growth.

This chapter concludes that trade (export) has been a 'growth engine' accelerating economic growth in Vietnam, and the export-led growth hypothesis is valid and consistent with Vietnam's data over the period studied (1989-2006). It is noted that, according to Leung (1995: 151): 'Governments of many industrial economies have come to recognise that reliance on world markets (outward orientation) gives much greater scope for economic growth than reliance on domestic markets (inward orientation)'.

The next Chapter Four will thus investigate the characteristics of Vietnam's merchandise exports in terms of comparative advantage, degree of specialisation, commodity and technology composition and so on? In addition, the main sources of Vietnam's exports growth, and export structure compared to that of the ASEAN-4 and its development path etc. will be meticulously discussed in Part II of this study.

Part II: Characteristics of Vietnam's Merchandise Exports

Chapter Four

ASEAN-5's COMPARATIVE ADVANTAGE OF MERCHANDISE EXPORTS

4.1 Introduction

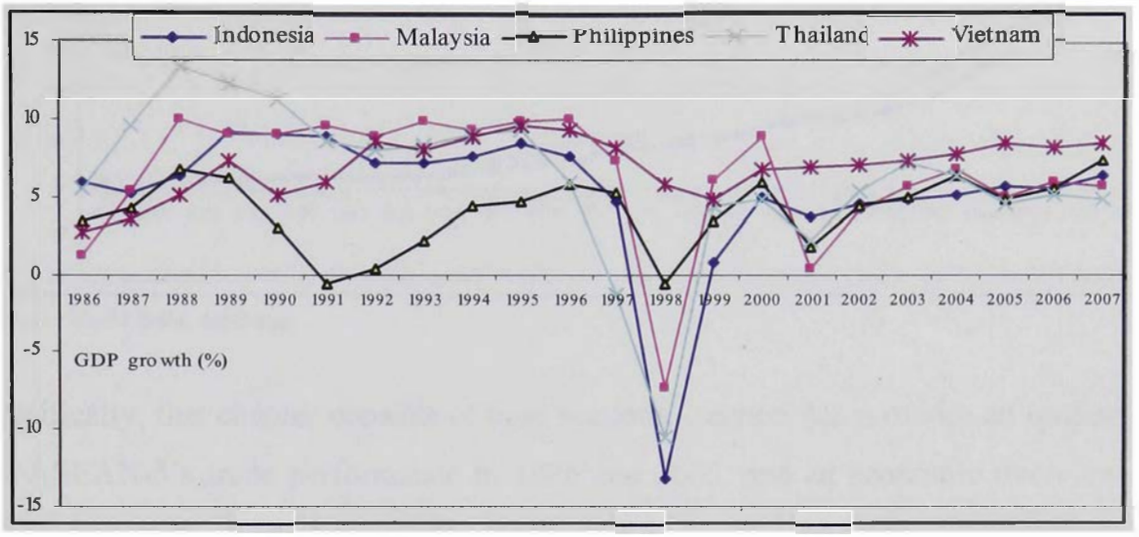
Vietnam has made remarkable economic progress following the adoption of Doi-Moi in 1986 as its national policy to transform the economy from a centrally planned system to a socialist-oriented market economy. The outstanding achievements of this 'trade openness' policy include macro-stability, the reduction of inflation from almost 900 per cent in 1986 to 5 per cent in 1993 (EAAU, 1997: 53), and an average GDP growth rate increasing from 5 per cent in the 1980s to 8 per cent in the 1990s. In the first half decade of this century, from 2000 to 2005, Vietnam's GDP growth rate also recorded 7.4 per cent average, while the average GDP growth rate of the ASEAN-4 registered at 4.7 per cent, 5.2 per cent, 4.4 per cent and 5 per cent respectively during the same period. It is noticeable that, before Doi-Moi, Vietnam's GDP was always below those of the ASEAN-4. This trend however has changed, gradually rising above the others, particularly between 1997 and 1998, and from 2001 onwards (see Figure 4.1 below).

Vietnam's openness (measured in terms of exports plus imports as a ratio of GDP) increased from 80 per cent in 1990 to 96.5 per cent[25] in 2000 compared to the average of East Asian and Pacific countries, from 47 to 64 per cent respectively over the same period (World Bank database). Between 1990 and 2006, the average merchandise trade as a ratio of GDP was recorded for Vietnam and the ASEAN-4 as follows: 87 per cent, 51 per cent (Indonesia), 170 per cent (Malaysia), 77 per cent (the Philippines) and 91 per cent (Thailand). These figures somewhat explain that trade is an important component in the economic development of the ASEAN-5 (with the

[25] This is very significant high share by international standards.

exception of Indonesia), as supported by the export-led growth hypothesis in the empirical analysis of Chapter Three.

Figure 4.1: ASEAN-5's GDP Growth Rate from 1986 to 2007 (%)



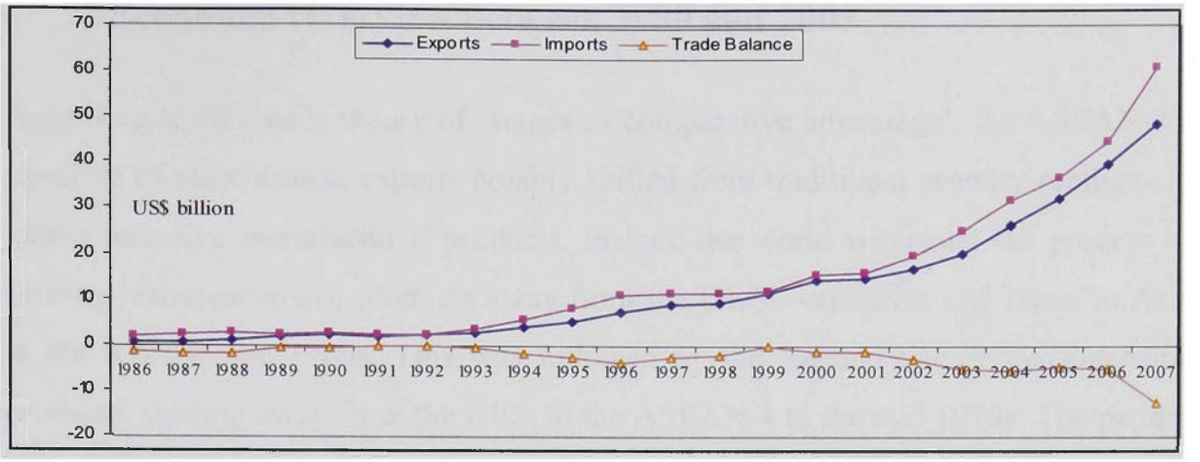
Source: World Bank database.

Over 1986-2007, Vietnam's merchandise exports increased considerably by sixty-one fold, from as little as US$789 million in 1986 to more than US$48 billion in 2007; and merchandise imports also rocketed by twenty-eight times, from US$2,155 million to almost US$61 billion (see Figure 4.2). It is noted that trade deficit has enlarged since the USV-BTA took effect in 2002.

While Vietnam's merchandise exports have experienced rapid growth, this rise of the export sector has not been homogeneous across all industries. A country will only sustain high economic growth if its merchandise exports to the global market are produced from the world rapidly growing industries; otherwise there is nothing to assure such a sustained high growth in the long run. One way to determine, whether a country is scrambling for the dynamic world market, is to analyse whether its export sector is based on the world high-growing industries. This is also one of the research questions for this chapter.

As confirmed by empirical analyses in Chapter Three, Vietnam's economic growth has been driven in part by exports. Consequently, this chapter investigates the main characteristics of Vietnam's exports in terms of comparative advantage, degree of specialisation, commodity and technology composition and so on.

Figure 4.2: Vietnam's Merchandise Exports, Imports and Trade Balance, 1986-2007



Source: World Bank database.

Specifically, this chapter consists of nine sections. Section 4.2 provides an outline of the ASEAN-5's trade performance in 1986 and 2005, and an economic overview of these countries over 1980-2005. Section 4.3 briefly reviews the theories of comparative advantage and competitive advantage. Section 4.4 discusses the methodology and qualifications of Balassa's revealed comparative advantage index employed to measure the trade specialisation of the ASEAN-5's 247 product categories classified at the three-digit of the Standard International Trade Classification (SITC) level. While Section 4.5 examines the ASEAN-5's pattern of revealed comparative advantage of the twenty-three product groups in the global market over 1997-2003, Section 4.6 observes the changing structure of the ASEAN-5's trade performance. Section 4.7 is followed to analyse whether the changing structure of comparative advantage of merchandise exports is beneficial or unfavourable to the countries concerned in the long run. Section 4.8 presents their top twenty exports classified by industry intensity such as natural resource-based industries, low-technology, medium-low-technology, medium-high-technology and high-technology industries. Section 4.9 discusses the issue of specialisation versus diversification and Section 4.10 finally concludes the chapter.

4.2 ASEAN-5's Trade Performance in 1986 and 2005, and Economic Overview between 1980 and 2005

According to Balassa's theory of 'stages of comparative advantage', the ASEAN-4's structure of merchandise exports notably shifted from traditional primary products to labour-intensive manufactured products. In fact, the world witnessed the process of shifting labour-intensive products away from the OECD countries and Japan in Asia to the NICs in the 1960s. This was followed by the 'second tier' labour-intensive products, shifting away from the NICs to the ASEAN-4 in the mid 1970s. The pattern of comparative advantage of an economy usually shifts from the production of primary products to labour-intensive manufactured commodities, and subsequently to capital and technology-intensive products (Fukushima and Kwan, 1995).

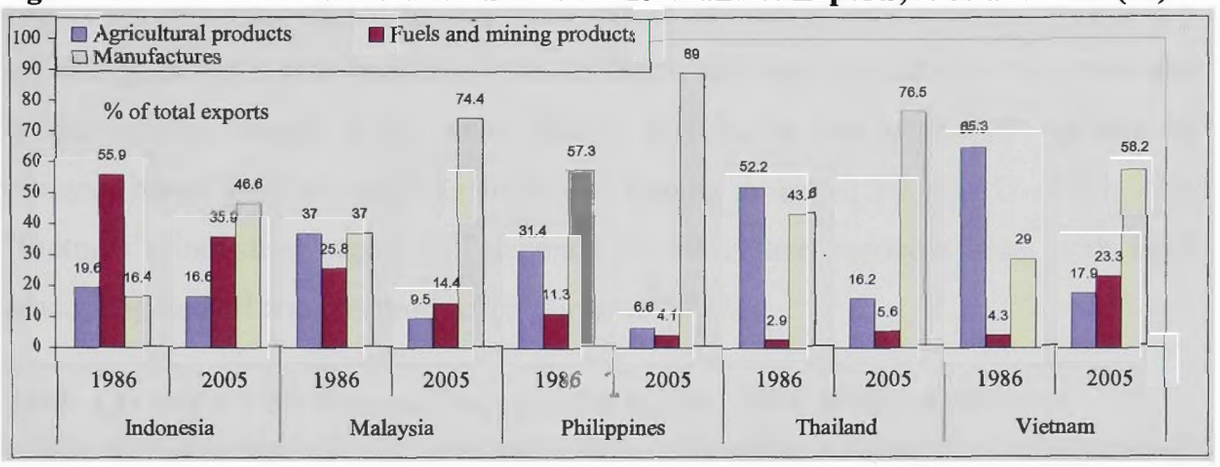
Also, in an empirical study on the changing trade and revealed comparative advantage of Asian and Latin America manufactures exports, Bender and Li (2002: 21) conclude:

> Based on the statistical data from the UNIDO source (1999), an empirical study supports the hypothesis of a comparative advantage shift between East Asia and Southeast Asia during the period 1981-1997, and that Latin America also captured the loss in comparative advantage in East Asia. Despite East Asia's strong growth in exports in the 1980s and 1990s, its export pattern is losing its comparative advantage to the lower-tier major ASEAN-4 and Latin American countries. Between the 1980s and 1990s, the falling strength in East Asia's trade is captured by the growing strength in the exports of ASEAN-4 and Latin American countries.

Figure 4.3 below shows that Vietnam's agricultural products declined more than triple between 1986 and 2005, from 65 per cent to 18 per cent of its total merchandise exports; while fuels and mining products increased more than fivefold, from 4 per cent to 23 per cent, and manufactures also climbed up double from 29 to 58 per cent of total exports. In the same period, Indonesia's and Malaysia's agricultural products shrank from 20 and 37 per cent to 17 and 10 per cent respectively. Their fuels and mining products also declined from 56 to 36 per cent for Indonesia, and from 26 to 14

per cent for Malaysia; while their manufactures increased considerably from 16 and 37 per cent to 47 and 74 per cent respectively.

Figure 4.3: ASEAN-5's Sectoral Structure of Merchandise Exports, 1986 and 2005 (%)



Source: ADB, Key Indicators 2006.

Among the ASEAN-5, the Philippines' structure of exports experienced a great deal of change with its agricultural products contracting nearly fivefold, from 31 down to 7 per cent, its fuels and mining products also declined nearly threefold from 11 to 4 per cent, while its manufactures increasing only one and a half, from 57 to 89 per cent. Thailand experienced similar changes with its composition of merchandise exports decreasing from 52 down to 16 per cent for agricultural products, while its manufactures and fuels and mining products increased from 44 and 3 per cent to 77 and 6 per cent respectively.

Prior to Doi-Moi in 1986, the structure of Vietnam's output could be classified as agrarian, since it relied heavily on primary and agro-business exports. After Doi-Moi, particularly from 1990 when its reform policies on agriculture, administration, banking and finance, exchange rate, foreign direct investment and services sector etc. had been implemented nationwide, the production pattern of the economy started to change rapidly, shifting from agricultural to labour-intensive manufactured products.

According to Table 4.1, it is apparent that in 1980 Vietnam's agricultural sector accounted for 50 per cent of its national output (GDP), and rapidly declined by half to 25 per cent in 2000 and lately settled at 21 per cent in 2005. The industry sector slightly dropped from 23 to 22.7 per cent in 1990 due to the chaotic period of reform

following Doi-Moi in 1986, but grew rapidly to 37 and 41 per cent in 2000 and 2005 respectively. By the same token, the movement of the manufacturing sector also declined from 19 per cent in 1980 to 12 per cent in 1990, and then bounced back to 19 and 21 per cent respectively in the same period. In other words, there was almost no net change in this sector between 1980 and 2000. This implies that the 14 per cent rise of the industry sector, in the same period, was due to the production increase in resource-based products such as fuels and mining as stated by EAAU (1997: 48): 'Vietnam's industrial sector still depends on the natural resource base, with food processing and oil and gas production dominating'.

Table 4.1: ASEAN-5's Sectoral Share of GDP in 1980, 1990, 2000 and 2005 (%)

	Agriculture				Industry				Manufactures				Services			
	1980	*1990*	*2000*	*2005*	*1980*	*1990*	*2000*	*2005*	*1980*	*1990*	*2000*	*2005*	*1980*	*1990*	*2000*	*2005*
Indonesia	25	19	16	13	43	39	46	46	12	21	28	28	32	42	39	41
Malaysia	n.a.	15	8	8	n.a.	42	48	50	n.a.	24	31	29	n.a.	44	43	42
Philippines	25	22	16	14	39	35	32	33	26	25	22	23	36	44	52	53
Thailand	23	13	9	10	29	37	42	44	22	27	34	35	48	50	49	46
Vietnam	50	39	25	21	23	22.7	37	41	19	12	19	21	27	39	39	38

Note: n.a.: not available.
Source: ADB, Key Indicators 2006.

Another reason for the manufacturing sector's stagnancy between 1990 and 2000 was the privatisation process of manufacturing SOEs and the government's relaxation on the SOEs subsidy policy, which ousted many non-profit making SOEs from the industry. Also, the two wars with Cambodia and China as mentioned in Chapter One and the closure of the CMEA markets for Vietnam's exports after the collapse of the Eastern European communist bloc in 1989.

The services sector almost held the same portion of the country's output at 38 per cent over 1990-2005, after an increase of 1.5-fold from 27 per cent in 1980. According to the World Bank (2001: 39):

> SOE's account for 30 per cent of GDP, 25 per cent of total investment, 15 per cent of non-agricultural employment and about 50 per cent of outstanding domestic bank credit. In 2001, there are 5,300 SOEs employing around 1.6 million people. A government survey of enterprises in late 1997 found that

> around 60 per cent of 5,800 SOEs were not profitable and the debt-to-asset ratio of a large number of SOEs was excessive. This situation deteriorated over two years of slow growth, low domestic demand and inadequate competitiveness. This situation follows a significant contraction of the SOE sector over the last ten years from 12,000 in 1990 to 5,300 in 2001,[26] and in actual SOE employment from 2.5 to 1.6 million. Their share of GDP and in industrial output has fallen too in the last ten years, mostly due to growth of the foreign-invested sector but also due to growth of domestic private sector, mainly of household enterprises.

In agriculture, between 1980 and 2005, Malaysia and Thailand also experienced a major decline of around 2.5 times, to levels of 8 and 10 per cent of their GDP respectively in 2005; while Indonesia and the Philippines shrank around 1.8 times from 25 per cent down to 13 and 14 per cent respectively.

In the same period, Thailand's industrial sector expanded more than other countries, except for Vietnam, which grew 1.5 times from 29 to 44 (or 15 per cent of GDP); while Indonesia increased by only 3 percentage points from 43 to 46 per cent and Malaysia expanded by 8 percentage points, from 42 to 50 per cent between 1990 and 2005.[27] Besides sharing certain economically occurrences in the late 1980s such as a period of moderately low petroleum prices providing low input costs of manufactured goods, and the relatively high growth of the world economy enhancing export sectors, Thailand enjoyed other favourable economic conditions such as the depreciation of the US dollar lowering the value of the Thai bath, when Thailand changed its exchange rate system from a fixed parity regime in 1981, and adopted the current managed-float system. This gave a significant boost to Thailand's export sector, making its products more competitive in the global market. In contrast to the growth experienced in the other four countries, the Philippines' industrial sector experienced a gradual drop from 39 per cent share of GDP in 1980 to 35 per cent in 1990 and finally settled at 33 per cent in 2005; however, a trade-off was recorded in the same

[26] The number of SOEs has dropped to around 3,000 at the end of 2005 through mergers, dissolution, and equitisation (the term used for privatisation in Vietnam). During the 2001-2005 period, around 2,000 SOEs was equitized. The state sector has been stripped of most subsidies and other privileges, while at the same time given greater autonomy in business. SOEs now operate as one-member limited liability companies (VinaTradeUSA, 2006).

[27] Data for Malaysia are not available in 1980.

period with an increase of 1.5-fold in the services sector, jumping from 36 to 53 per cent.

Also, the services sector of Indonesia increased by 9 percentage points, from 32 to 41 per cent over the twenty-five year period, while this sector in Thailand declined by 2 percentage points, from 48 to 46 per cent; and Malaysia followed behind Thailand with a drop of 2 percentage points between 1990 and 2000. As was the case for the manufacturing sector, whose movement was correlated with the industry sector, except for Vietnam as discussed above.

The discussion in this section has given only a general view of the changing structure of the ASEAN-5's economies during the 1980-2005 period. Details of which comparative advantage industries as well as the determination of the revealed comparative advantage of the ASEAN-5's 247 product categories at the three-digit level of the Standard International Trade Classification (SITC) will be examined in latter sections. The next section will provide an overview of the theory of comparative advantage and competitive advantage.

4.3 Competitive Advantage and Comparative Advantage

4.3.1 Competitive Advantage

Competitive advantage is the ability of a country to successfully compete internationally in a number of merchandise goods and/or services and sustain improvements in real output and wealth. According to National Competitiveness Council, 2002: 2):

> The literature on competitiveness supplies a wide variety of definitions of the term. One of the most straightforward definitions, supplied by the World Economic Forum, is that competitiveness is the ability of a country to achieve sustained high rates of growth in GDP per capita. A similar but more detailed definition, supplied by the OECD, is that competitiveness is the degree to which a nation can, under free trade and fair market conditions, produce goods and services which meet the test of international markets, while simultaneously maintaining and expanding the real incomes of its people over the long-term. The definition favoured by the National Competitiveness Council is that competitiveness is the ability to achieve success in markets leading to better standards of living for all. Competitiveness is something that is important at a range of levels, from the level of the individual firm to the level of an industry and from the level of a small local region to the level of an association of nation states. The National Competitiveness Council is concerned with the country as a whole, with promoting the success in national and international markets of the enterprise sector overall and with the ultimate objective of promoting improved standards of living for all people in the country.

Competitive advantage is used by economists in various ways. One is measured in terms of relative price and/or cost indices, while the other is focused on structural factors affecting medium-to long-term economic performance such as productivity, innovation, skills and so on (Daquila, 2005: 127). In this context, Porter (1990) developed a new paradigm which takes into account the changes in the nature of competition, and which challenges the traditional theory of comparative advantage by emphasising on productivity growth. Porter's concept of competitiveness at the national level is national productivity. A rising standard of living depends on the capacity of a nation's firms to achieve high levels of productivity and to increase

productivity over time. A nation's firms must relentlessly improve productivity in existing industries by raising product quality, adding desirable features, improving product technology or boosting production efficiency. Porter (1990: 7) also states that:

> If there were no international competition, the level of productivity attainable in a nation's economy would be largely independent of what was taking place in other nations. International trade and foreign investment, however, provide both the opportunity to boost the level of national productivity and a threat to increasing or even maintaining it. International trade allows a nation to raise its productivity by eliminating the need to produce all goods and services within the nation itself. A nation can thereby specialise in those industries and segments in which its firms are relatively more productive and import those products and services where its firms are less productive than foreign rivals, in this way raising the average productivity level in the economy. Imports, then, as well as exports are integral to productivity growth.

Porter (1990: 7-10) further argues the following points.

- The process of expanding exports from more productive industries, shifting less productive activities abroad through foreign investment, and importing goods and services in those industries where the nation is less productive, is a healthy one for national economic prosperity. In this way, international competition helps upgrade productivity over time. The process implies, however, that market positions in some segments and industries must necessarily be lost if a national economy is to progress.
- Employing subsidies, protection, or other forms of intervention to maintain such industries only slows down the upgrading of the economy and limits the nation's long-term standard of living.
- If the industries that are losing position to foreign rivals are the relatively more productive ones in the economy, a nation's ability to sustain productivity growth is threatened.
- The expansion of exports because of low wages and a weak currency, at the same time as the nation imports sophisticated goods that its firms cannot produce with sufficient productivity to compete with foreign rivals, may bring trade into balance or surplus but lowers the nation's standard of living. Instead, the ability to export many goods produced with high productivity, which

allows the nation to import many goods involving lower productivity, is a more desirable target because it translates into higher national productivity.

- It is high productivity jobs, not any jobs that translate into high national income.
- A rising national share of world exports is tied to living standards when rising exports from industries achieving high levels of productivity contribute to the growth of national productivity. A fall in overall world export share because of the inability to successfully increase exports from such industries, conversely, is a danger signal for a national economy. However, the particular mix of industries that are exporting is more important than a nation's average export share. A rising sophistication of exports can support productivity growth even if overall exports are growing slowly.
- To achieve competitive success, firms from the nation must possess a competitive advantage in the form of either lower costs or differentiated products that command premium prices. To sustain advantage, firms must achieve more sophisticated competitive advantages over time, through providing higher-quality products and services or producing more efficiently. This translates directly into productivity growth.
- Increased trade has led to increased specialisation in narrowly defined industries and in segments within industries. Were it not for protection, which sustains firms and entire national industries with no real competitive advantage, the differences among nations in competitive position would be even more apparent.[28]

Competitive advantage (or competitiveness) can also be measured by various methods such as the unit labour costs, the long-run average growth of real GDP, the business competitiveness index (BCI)[29] and the growth competitiveness index (GCI)[30] etc.

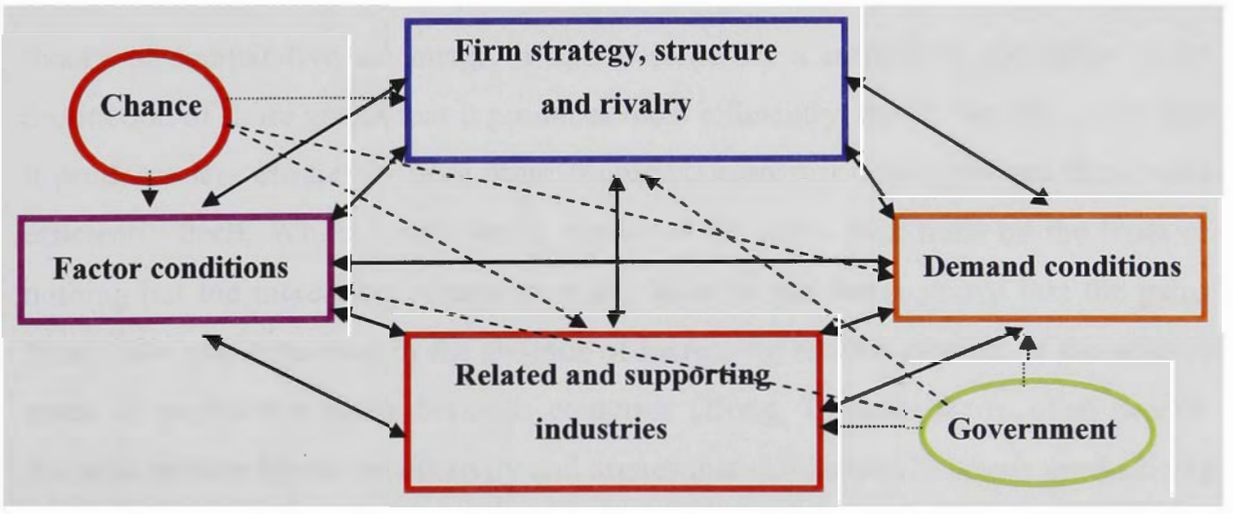
[28] Governmental distortions are prevalent in such industries as apparel, agriculture, automobiles, aircraft, and telecommunications, not to mention many others. Protection and administrative regulations, for example, have significant distorted the patterns of national advantage in Europe. The onset of 1992 in Europe, if real barriers to trade decline, will mean that national economies are likely to become more concentrated in those industries where they have true competitive advantage.

[29] The BCI was first introduced in *The Global Competitiveness Report 2000* by Xavier Sala-i-Martin, (p. xi-xxiv). The argument is that an economy cannot be competitive unless firms doing business there are competitive, whether they are domestic companies or affiliates of foreign companies. The BCI index is measured based on two sub-indices: (a) the sophistication of company operation and strategy, and (b) the quality of the national business environment.

Nevertheless, the concept of national competitiveness is viewed as elusive by Paul Krugman (1994a). Krugman states that when we say a corporation is uncompetitive, we mean that its market position is unsustainable, that unless it improves its performance it will cease to exist. He further argues that countries, on the other hand, do not go out of business as they may be happy or unhappy with their economic performance, but they have no well-defined bottom line. Figure 4.4 below presents Porter' theory of national competitive advantage, which consists of various determinants such as factor conditions, demand conditions, related and supporting industries and firm strategy, structure and rivalry.

1. Factor conditions refer to a nation's position in factors of production such as skilled labour or infrastructure, necessary to compete in a given industry.
2. Demand conditions refer to the nature of domestic demand for the industry's product or service.
3. Related and supporting industries refer to the presence or absence in the nation of supplier industries and related industries that are internationally competitive.
4. Firm strategy, structure and rivalry are concerned with the conditions in a country that govern the ways companies are created, organised and managed, and the nature of domestic rivalry.

Figure 4.4: Porter's Diamond



[30] The GCI index was developed by Jeffrey D. Sachs and John McArthur. This index determines the capacity of the national economy to achieve sustained economic growth over the medium and long-term. The CGI is based on three sub-indices: (a) the macroeconomic environment, (b) the quality of public institutions, and (c) technology.

Porter's diamond shows that these four conditions interact with one another as well as with government influence and chance. While government influence is evident in the policies that impact each of these determinants, chance refers to development opportunities that are beyond a firm's control or, sometimes, government's control.

4.3.2 Comparative Advantage

The growth and restructuring of world industry has a cause-and-effect relationship with shifts in comparative advantage, and comparative advantage itself has come to be regarded as a constantly changing (or dynamic) concept (UNIDO, 1982). Sheehan et al. (1994: 67-8) state that comparative advantage is a central concept in conventional neoclassical international trade theory, and refers to the ability of a country to produce a commodity at a relatively low price on the basis of factor endowment and prices prevailing in a pre-trade situation, this differential ability arising from relative differences in resource endowments, preferences and tastes. Thus, comparative advantage is defined not only in terms of the assumptions of pure competition but also in terms of pre-trade relative prices. An important task facing applied economists, then, has been to try to identify comparative advantage from observations of real world trading outcomes, which embody both post-trade relative prices and the range of distortions characteristic of actual markets.

There are several theoretical perspectives that are widely used in the analysis of comparative advantage in international trade among countries. According to Ricardo's theory of comparative advantage, it makes sense for a country to specialise in the production of those goods that it produces most efficiently, and to buy the goods that it produces less efficiently from other countries, even if it could produce them more efficiently itself. While Adam Smith explained the gains from trade on the basis of nothing but the increasing returns to scale, Ricardo has demonstrated that the gains from trade can arise even in the absence of increasing returns to scale, if the relative costs of production differ between countries (Hong, Chapter 3). In other words, Ricardo stresses labour productivity and argues that differences in labour productivity between nations underlie the notion of comparative advantage. Therefore, Smith's and Ricardo's arguments complement each other, filling up the gaps between the available theories and the real world. Chow and Kellman (1993: 124) state:

> It is generally inferred from the Ricardian model of comparative advantage that success in exports is associated with a certain degree of specialisation in production of those products in which the exporting countries enjoy comparative productivity advantages vis-à-vis their potential trading partners. Subject to constraints of diminishing returns, one would expect that as market forces are increasingly allowed to play their role in the determination of export compositions, one would find over time a growing degree of such specialisation. The Ricardian model suggests that the direction of causality runs from specialisation to export success.

However, Heckscher-Ohlin's (H-0) theory attempts to explain that the pattern of trade is determined by differences in factor endowments, rather than differences in productivity. The greater the ability of a country to direct its resources to those products or sectors in which it enjoys comparative advantage, the greater will be its exports at any point in time. This suggests that the existence of persistent trade patterns is perfectly consistent with the model, if relative factor endowments of countries do not change significantly with respect to their main trading partners. Krueger (1978) and Baldwin (1979) have extended this idea to predict that of a country's exports, the more labour-intensive goods will go to countries more generously endowed with capital than itself, and the more capital-intensive ones will go to countries less well endowed with capital. Nevertheless, both theories are subject to pragmatic limitations that, according to Srisathaporn (1997: 229), Balassa (1965, 1989) points out as follow.

On the one hand, some problems may arise on attempting to apply the Hecksher-Ohlin theory to either, more than two factor inputs or more than two countries. Awkwardness may occur when the absence of factor reversals is assumed, which forces researchers to rank factors according to the relative factor intensities. It is easy in the case of two factors but will be difficult with more than two inputs involved. For example, the analysis involves three factor inputs whereas there is only pair-wise unique ranking among factors. It is the same in the case where more than two countries involved.

On the other hand, the classical theory of comparative advantage suffers from lack of suitable comparative data used as a proxy representing efficiency. In general, the productivity of labour is a widely acceptable proxy; however, its availability is questionable for a number of countries, specifically in developing economies. Moreover, the classical theory overlooks the importance of inter-industry differences in capital costs and non-price factors. Leaving out non-price factors (e.g., quality differences, goodwill, services, the existence of repair facilities etc.) may lead to an inaccurate perception of the present world economy, where non-price factors have significant impacts on the pattern of international trade.

A country's comparative advantage in goods (and services) can be measured by various ways such as Balassa's revealed comparative advantage index (1965), Bowen's net trade intensity index and production intensity index (1983), UNIDO's net export ratio (1986) and Zhang's net export performance ratio (2000) etc.

The next section will discuss the methodology and qualifications of Balassa's revealed comparative advantage index.

4.4 Revealed Comparative Advantage: Methodology and Qualifications

According to Dowling and Cheang (2000: 444-45):

> The primary role of revealed comparative advantage is to quantify the commodity-specific degree of comparative advantage, rank countries by the degree of comparative advantage, and provide a demarcation between countries that enjoy comparative advantage in some commodity and those that do not (Ballance et al., 1987; Forstner and Ballance, 1990). More importantly, revealed comparative advantage can be employed to analyse shifts in comparative advantage, trade patterns, and structural adjustment in individual industries, countries and/or regions (e.g., Rana, 1990; Yamazawa et al., 1991; Fukasaku, 1992; Chow and Kellman, 1993). Hence, revealed comparative advantage can be used to explore the association between industrial development, trade, and economic development, and identify the production structures and patterns of trade at different stages of economic development.

In 1965, Balassa introduced what he called the index of revealed comparative advantage (RCA), which was first used by Liesner in 1958. This index has become well known and broadly used by many researchers to identify a country's competitiveness in certain industries or products in relation to international trade. RCA measures can be employed to analyse the changing pattern of comparative advantage across commodities as a result of a process of accumulation of physical and human capital that characterises economic development (Balassa, 1979). This index is a country's share in the world exports of a given commodity (or industry) relative to that country's overall share in total world exports, that is:

$$RCA_{ij} = \frac{X_{ij} / \sum_j X_{ij}}{\sum_i X_{ij} / \sum_i \sum_j X_{ij}} \qquad [4.1]$$

where: X_{ij} = exports of the j product from the i *th* country

$\sum_j X_{ij}$ = total world exports of the j product

$\sum_i X_{ij}$ = total exports of the i *th* country

$\sum_i \sum_j X_{ij}$ = total world exports

Balassa also suggested a second index, taking into account the import factor in the denominator, to investigate the conditions of a country's trade balance as follows:

$$RCA_{ij} = \frac{X_{ij} / M_{ij}}{\sum_i \mathrm{X_{ij}} / \sum_i \mathrm{M_{ij}}} \qquad [4.2]$$

The equation [4.2] can be rearranged as:

$$RCA_{ij} = \frac{X_{ij} / \sum_i X_{ij}}{M_{ij} / \sum_i M_{ij}} \qquad [4.3]$$

where: M_{ij} = imports of the j product in the i *th* country

$\sum_i M_{ij}$ = total world imports of the j product

However, according to Maule (1996: 21):

> It is possible that actual trade patterns, on which RCA calculations are based, may not reflect true comparative advantage. The divergence between RCA and true comparative advantage results primarily from market distortions caused by government intervention. Since actual trade data is used to calculate indices of RCA, the problem arises that the results may reflect not only natural forces of comparative advantage but also the effects of market distortions. These include tariffs, quotas, export incentives, extraordinarily high transport costs, embargoes, labour market distortions and myriad other government distortion activities. In fact, most RCA studies are limited to processed goods and manufactured items because the presence of government in the trade of agricultural products is often strong. All this points to the fact that, the real comparative advantage of products might be distorted so much that the RCA approach may be misleading and may obscure 'real' patterns of comparative advantage.

On the other hand, the RCA [4.1] measure can also be distorted by availability of data at various levels of aggregation. For example, Chow and Kellman (1993) state that the RCA indices of more disaggregated trade data such as five or six digits of Standard International Trade Classification (SITC) would be considerably different from more aggregated trade data such as one-or two-digit product classification. Maule (1996: 22) further affirms that: (1) the RCA index might not accurately reflect underlying

comparative advantage, because of domestic distortions such as protection structures and international distortions such as a country having a relatively small quota allocated to it by the major importing countries; (2) domestic distortions would affect the numerator in [4.1] but leave the denominator unchanged. In the case of a negative distortion, which would hurt the competitiveness of a product, the numerator would relatively smaller, thus making the whole RCA export index relatively smaller, and (3) another question concerns the relevance of the RCA approach in the presence of significant intra-industry trade that would be reflected by a country exporting a product as well as importing that same product in significant quantities. Significant amounts of intra-industry specialisation will yield high RCA export and RCA import indices for the same product categories. Lastly, product differentiation by consumers' taste in the importing countries would be another factor contributing to the distortion of this index, although they are classified in the same product group by the SITC category, for example computers produced by the United States are preferred to computers produced by China.

A country, say Vietnam, is said to have a comparative advantage in producing and exporting a product *j* (or industry *j*) to any reference countries, say the ASEAN-4, if its RCA value is greater than unity [1, 8], since the portion of Vietnam's *j* product (or industry) penetrates and is consumed more than that of the ASEAN-4 in the world market. In other words, if the estimated RCA is greater than unity, the suggestion is that Vietnam's exports are moving closer to the pattern of the world exports at a relatively fast pace. Conversely, if its RCA value is less than unity [0, 1], this product (or industry) is said to have a comparative disadvantage. For example, if an index of a given product (or industry) is 1.5, this means the export share of this product (or industry) is 50 percent higher than the share of world exports of the same product (or industry). This infers that Vietnam has an advantage over the rest of the world by approximately 50 per cent, whereas an index of one *(1)* indicates Vietnam has neither comparative advantage nor disadvantage relative to the rest of the world in terms of producing and exporting that particular product.

The equation [4.2] index represents the rate of coverage of imports by exports of the *j* product divided by the rate of coverage of imports by exports of all products traded in

the *i th* country. Thus, if the index [4.2] has a value greater than unity [1, 8], then the *j th* product (or industry) has a positive effect upon its trade balance. On the contrary, if the index value lies between [0, 1], then it registers a negative effect.

Numerous scholars attempt to introduce various indices in measuring the comparative advantage of a country's given commodity or industry, or comparing the trade performance between the exporting countries. Bowen (1983) suggested two indices based on the concept that revealed comparative advantage is a net trade, which he called '*net trade intensity index*' and '*production intensity index*'. UNIDO (1982, 1986) introduced the '*net export ratio*', which expresses the net exports of commodity *j* as a proportion of the total trade flows of commodity *j*. Zhang (2000) considers a country's exports and imports of individual commodities as well as their relative position in the world market by introducing the '*net export performance ratio*' etc.

In this chapter, we make use of Balassa's index [4.1] for the analysis of Vietnam's trade performance and trade pattern from 1990 to 2003, and the ASEAN-4 over the 1980-2004 period. The main reason why Balassa's index has been selected for this study is that the time series under investigation covers the period that the economy of Vietnam transformed from a centrally planned system to a socialist-oriented market economy, where Doi-Moi policy required an enormous volume of imports such as skills, knowledge, machinery and technology etc. to build up its primitive and laggard infrastructure. It is evident from the earlier part of this chapter that Vietnam has had a negative trade balance since 1986 (refer to Figure 4.2 above), and it is also evident that this does not reflect the true conditions of Vietnam's long-term economy. The results, thus, would be distorted and inaccurate if this study had taken into account the import factor when comparing Vietnam's and the ASEAN-4's trade performance, since the latter economies have reached a saturation point, or in other words, their foreign trade is either in equilibrium or in surplus between imports and exports values. Although the RCA [4.1] index has some limitations as discussed above, it can still provide us with useful and important information about the relative trade performance of Vietnam and the ASEAN-4.

To analyse the shifts of comparative advantage of the NICs, Chow and Kellman (1993) use the three-digit product categories of the SITC (Revision 1), which covers

101 manufactured products to assess the relative trade performance of these four East Asian's economic dragons in the OECD market. This study is more comprehensive because it expands the product categories to all merchandise exports, which contain the primary and manufactured sectors with 247 product categories at the three-digit SITC (Revision 3) level. The only sector excluded is commercial services. Also, the importing market here is not limited to the OECD but extends to the whole global market; since Vietnam and the ASEAN-4 have become more and more integrated into the globalisation process. The emergence of ASEAN Free Trade Area (AFTA) more than a decade ago as well as the USV-BTA in December 2001 and Vietnam's recent accession into the WTO in January 2007 are typical symbols of that process. While the analyses of the RCA indices are calculated at the level of disaggregation of 247 product categories, the tabular presentations of these 247 product categories were aggregated, classified and grouped at a more aggregated level of twenty-three product groups according to Revision 3 of the Standard International Trade Classification.[31]

The 'open door' policy in Vietnam began in 1986 and became fully operational on a national scale four years later, yet Vietnam's disaggregated trade data at three-digit SITC level (revision 3) are available only from 1997 to 2003. The time series for the ASEAN-4, thus, are selected over the same period. However, the period is extended to 2005 for a non-parametric test in Section 4.7 because Vietnam's data are available on the UNCTAD/WTO database, but only with ninety-seven product categories disaggregated at the two-digit HS-2002 level.

Unless specified elsewhere, all the trade data used in this chapter are obtained from the United Nations Comtrade database and the World Trade Organisation statistics database.

[31] It should be noted that some product groups of the twenty-three product groups in this study are sub-groups of the others by the UN Comtrade's definition. For example, in Table 4.2 below, (1) and (2) are sub-groups of agricultural products; (3), (4), (5) are sub-groups of fuels and mining products; (7), (8) are sub-groups of chemicals; (10), (11), (12) are sub-groups of office and telecommunications equipment; (13), (14) are sub-groups of transport equipment; (15), (16), (17) are sub-groups of other machinery; (20), (21), (22) are sub-groups of other manufactures. The total of merchandise exports is an addition of all 23 product groups, which are grouped from 247 product categories at the 3-digit SITC level (revision 3). A detailed table of the ASEAN-5's 247 revealed comparative advantage product categories is Table A4.1 in the list of appendix tables.

4.5 ASEAN-5's Pattern of Revealed Comparative Advantage in the World Market from 1997 to 2003

Tables 4.2 to 4.5 indicate the RCA of the ASEAN-4's twenty-three export product groups in the world market for the selected years from 1997 to 2003. General trends in Vietnam's trade performance during this period can be seen in Table 4.2 below.

4.5.1. Vietnam

Among twenty-three product groups as classified in 2003, Vietnam had five revealed comparative advantage product groups, which were food (declining), raw materials (declining), fuels (declining), clothing (increasing), and personal and household goods (increasing).

Table 4.2: Vietnam's RCA in the World Market by Product Group, Calculated at 3-digit SITC Level, 1997 to 2003

No.	Product Group	1997	1998	1999	2000	2001	2002	2003	1997-2003
1	Food	3.75	4.02	3.50	3.58	3.79	3.66	3.33	3.66
2	Raw materials	1.50	1.08	0.92	1.06	1.07	1.29	1.35	1.18
3	Ores & other minerals	0.25	0.30	0.34	0.28	0.45	0.38	0.37	0.34
4	Fuels	3.00	2.90	2.96	2.66	2.46	2.55	2.62	2.74
5	Non-ferrous metals	0.11	0.13	0.07	0.08	0.10	0.07	0.08	0.09
6	Iron & steel	0.05	0.05	0.09	0.11	0.13	0.16	0.16	0.11
7	Pharmaceuticals	0.05	0.03	0.02	0.02	0.02	0.02	0.02	0.03
8	Other chemicals	0.12	0.12	0.14	0.11	0.18	0.17	0.18	0.15
9	Other semi-manufactures	0.49	0.34	0.46	0.37	0.42	0.44	0.47	0.43
10	EDP & office equipment	0.01	0.75	0.59	0.54	0.49	0.36	0.43	0.45
11	Telecom equipment	0.32	0.24	0.14	0.11	0.15	0.20	0.20	0.19
12	IC & electronic components	0.20	0.17	0.14	0.11	0.15	0.10	0.14	0.14
13	Automotive products	0.00	0.00	0.01	0.01	0.01	0.02	0.02	0.01
14	Other transport equipment	0.07	0.14	0.18	0.14	0.21	0.19	0.21	0.16
15	Power generating machinery	0.08	0.11	0.10	0.20	0.18	0.21	0.27	0.16
16	Non-electrical machinery	0.11	0.06	0.09	0.07	0.11	0.08	0.09	0.09
17	Electrical machinery	0.78	0.22	0.27	0.45	0.42	0.44	0.50	0.44
18	Textiles	0.52	0.57	1.06	0.73	0.93	0.92	0.87	0.80
19	Clothing	4.56	4.16	4.09	3.87	3.64	4.73	5.23	4.33
20	Personal & household goods	4.76	4.53	4.52	4.49	4.66	5.13	5.53	4.80
21	Scientific & controlling inst.	0.06	0.04	0.06	0.05	0.08	0.09	0.08	0.07
22	Miscellaneous manufactures	0.39	0.25	0.38	0.36	0.43	0.49	0.46	0.39
23	Other products	1.45	3.54	0.45	1.06	0.26	0.26	0.19	1.03

Source: Author's calculation based on UN Comtrade database.

In food, the product groups that reported strongest competitiveness in the world market (in descending order) were rice (RCA 43); crustaceans, molluscs (RCA 39.4); fish, dried, salted, smoked (RCA 7.3); fish, fresh, chilled, frozen (RCA 5.9); fish

prepared, preserved (RCA 4.4) and oilseed (RCA 2.8). In raw materials, the descending revealed comparative advantage product groups namely were: natural rubber (RCA 24.5); wood in chips, particles (RCA 5.6); vegetable textile fibres (RCA 5); fuel wood, wood charcoal (RCA 3.8) and silk (RCA 2.9). In fuels, the competitive product groups were crude petroleum oils (RCA 6) and coal, not agglomerated (RCA 3.6). In clothing, strong revealed comparative advantage groups were men, boys clothing k-nit (RCA 10.7); men, boys clothing x-knit (RCA 10); women, girls clothing knit (RCA 7.8); women, girl cloth, x-knit (RCA 4.4); other textile apparel n.e.s (RCA 4.4); clothing accessories, fabric (RCA 2.5) and clothing non-textile, headgear (RCA 1.8). In personal and household goods, the strongest competitive product was footwear (RCA 16.2); then trunk, suitcases, bags etc. (RCA 4.9) and furniture, cushions etc. (RCA 3.2).

It is noted that, textiles shifted from comparative disadvantage to advantage in 1999 but lost its competitiveness in the following years; the last product group (goods not classified by kind) also lost its competitiveness in 1999 and then picked up in 2000; however, became comparative disadvantage from 2001. The competitiveness in clothing and personal and household goods was very strong but gradually declining until 2002, then picked up and expanded even more than the initial year 1997, especially after the USV-BTA. Clothing exports to the United States alone in 2002 (US$1,018 million) accounted for 39 per cent of Vietnam's clothing exports to the world (US$2,633 million), and this portion increased considerably to 57 per cent in the following year (2003) with the value of US$1,979 million.

Other product groups with potential growth in the future, although within the comparative disadvantage range but slightly increasing their competitive trend, were iron and steel, other chemicals, electronic data processing and office equipment, automotive products, other transport equipment, power generating machinery and scientific and controlling instruments. On the contrary, the product groups that experienced declining competitiveness with more comparative disadvantage were non-ferrous metals, pharmaceuticals, telecommunications equipment, and integrated circuit and electronic components.

In brief, the economic development of Vietnam over this period was still in the early stage of labour intensive production, which concentrates on natural resource-based and low value-added industries.

4.5.2 Indonesia

In 1997, Indonesia had nine revealed comparative advantage product groups (see Table 4.3 below). Whereas one of them in the last group (other products, SITC section 9 and group 891) lost its competitiveness from 1999, the telecommunications equipment group started gaining comparative advantage from 2000 (RCA 1.03), and non-ferrous metals also gained competitiveness in 2003 (RCA 1.11). Of the ten revealed comparative advantage product groups in 2003, half of them belonged to agriculture (such as food with increasing trend) and resource-based products (raw materials, ores and other minerals with increasing trend and fuels with declining trend); and the other half in manufacturing sector such as other semi-manufactures (declining), telecommunications equipment (fluctuant), textiles (increasing), clothing (fluctuant) and personal and household goods (declining). In other semi-manufactures, the product groups that had strong competitiveness were veneers, plywood, etc. (RCA 10.7); wood manufactures n.e.s (RCA 5.5); paper, paperboard, cut etc. (RCA 3.0); then containers, storage, transport (RCA 1.7); rubber tyres, tubes etc. (RCA 1.7); pottery (RCA 1.6) and glass (RCA 1.4). In telecommunications equipment, the revealed comparative advantage product groups were sound recorder, phonograph (RCA 3.0) and radiobroadcast receiver (RCA 2.7).

In textiles, there were: textile yarn (RCA 4.4); fabrics, man-made fibres (RCA 3.6) and cotton fabrics, woven (RCA 1.6). Those in clothing had strong competitiveness were: men, boys clothing, x-knit (RCA 3.2); women, girls clothing x-knit (RCA 2.8); men, boys clothing knit (RCA 2.3); other textile apparel, n.e.s (RCA 1.9) and women, girls clothing knit (RCA 1.7). Lastly, in personal and household goods, the revealed comparative advantage gained in footwear (RCA 2.6) and furniture, cushions etc. (RCA 2.4).

Table 4.3: Indonesia's RCA in the World Market by Product Group, Calculated at 3-digit SITC Level, 1997 to 2003

No.	Product Group	1997	1998	1999	2000	2001	2002	2003	1997-2003
1	Food	1.43	1.38	1.35	1.24	1.23	1.55	1.61	1.40
2	Raw materials	2.11	2.32	1.86	1.83	1.93	2.33	2.62	2.14
3	Ores & other minerals	3.08	2.90	3.03	3.04	3.63	3.46	3.45	3.23
4	Fuels	3.90	3.53	3.15	2.41	2.67	2.82	3.11	3.08
5	Non-ferrous metals	0.64	0.70	0.76	0.78	0.86	0.96	1.11	0.83
6	Iron & steel	0.22	0.47	0.39	0.32	0.29	0.30	0.32	0.33
7	Pharmaceuticals	0.05	0.06	0.06	0.06	0.05	0.05	0.05	0.05
8	Other chemicals	0.55	0.54	0.52	0.56	0.60	0.55	0.57	0.56
9	Other semi-manufactures	1.58	1.41	1.56	1.41	1.43	1.37	1.27	1.43
10	EDP & office equipment	0.30	0.29	0.38	0.74	0.60	0.68	0.54	0.50
11	Telecom equipment	0.84	0.70	0.62	1.03	1.15	1.17	1.00	0.93
12	IC & electronic components	0.10	0.10	0.14	0.22	0.22	0.23	0.27	0.18
13	Automotive products	0.04	0.04	0.05	0.06	0.06	0.07	0.08	0.06
14	Other transport equipment	0.14	0.26	0.16	0.13	0.12	0.16	0.19	0.17
15	Power generating machinery	0.19	0.37	0.24	0.32	0.23	0.32	0.40	0.30
16	Non-electrical machinery	0.07	0.11	0.09	0.12	0.10	0.13	0.12	0.11
17	Electrical machinery	0.31	0.34	0.36	0.48	0.55	0.57	0.60	0.46
18	Textiles	1.33	1.61	1.94	1.89	1.98	1.77	1.70	1.75
19	Clothing	1.56	1.56	2.19	2.22	2.31	2.00	1.94	1.97
20	Personal & household goods	1.57	1.25	1.99	1.96	1.92	1.68	1.63	1.71
21	Scientific & controlling inst.	0.04	0.03	0.04	0.05	0.05	0.05	0.04	0.04
22	Miscellaneous manufactures	0.58	0.96	0.40	0.41	0.45	0.40	0.40	0.51
23	Other products	4.05	5.73	0.95	0.20	0.26	0.20	0.15	1.65

Source: Author's calculation based on UN Comtrade database.

One good thing about Indonesia over this period is an increasing trend of its comparative advantage in high value-added product groups, albeit their RCA indices were still below unitary. These groups were electronic data processing and office equipment, integrated circuit and electronic components, automotive products, power generating machinery, non-electrical machinery and electrical machinery.

4.5.3 Malaysia

It appears that Malaysia has concentrated its specialised export production in high value-added products (see Table 4.4 below). Besides the three revealed comparative advantage product groups in food (fluctuate), raw materials (declining) and fuels (declining); there were three other in manufacturing sector in 1997 such as electronic data processing and office equipment (increasing), telecommunications equipment (declining) and integrated circuit and electronic components (increasing). Moreover, another product group has emerged in the list of revealed comparative advantage groups was electrical machinery.

On the contrary, however, there was a declining trend in Malaysia's comparative advantage in low value-added product groups such as textiles, clothing and personal and household goods. It is noticeable that this declining trend was also existing in other resource-based (e.g. raw materials, ores and other minerals) as well as high value-added groups like pharmaceuticals, other semi-manufactures, telecommunications equipment, automotive products, other transport equipment and power generating machinery.

According to Mahmood (2001), among other factors, these downward trends in absolute levels of RCA index point to rising competition due to regionalisation (AFTA) and globalisation, affecting price and non-price determinants of revealed comparative advantage. The results from this study also correspond with those of Mahmood (2001) for Malaysia in the 1994-1998 period, when he stated that 'while the economic crisis of 1997 might have dampened the comparative advantage position of some segments of the electrical and electronic sub-sector, the declining RCA trends in several industries in the sub-sector were already in place even before the economic crisis hit the region. For instance, industries such as office machines, television receivers and telecommunications equipment have been experiencing declining RCAI since 1994' (Mahmood, 2001: 204).

In 2003, Malaysia had seven comparative advantage product groups. In food, strong competitive products such as fixed vegetable, fat oils, other (RCA 35.5); animal, vegetable fats oils, n.e.s (RCA 18.0) and eggs, birds, yolks, albumin (RCA 3.4). In raw materials there were natural rubber, etc. (RCA 11.1); wood rough, rough squared (RCA 5.7); wood, simply worked (RCA 2.1) and fuel wood, wood charcoal (RCA 1.7). In fuels: coal gas, water gas etc. (RCA 8.4); petroleum gases n.e.s (RCA 5.4); natural gas (RCA 3.3) and crude petroleum oils (RCA 1.2). In electronic data processing and office equipment: parts for office machines (RCA 3.7) and automatic data processing equipment (RCA 2.9). In integrated circuit and electronic components was transistors, valves etc. (RCA 5.5); and only one product group in electrical machinery was electrical switch, relay circuit (RCA 2.0).

Table 4.4: Malaysia's RCA in the World Market by Product Group, Calculated at 3-digit SITC Level, 1997 to 2003

No.	Product Group	1997	1998	1999	2000	2001	2002	2003	1997-2003
1	Food	1.39	1.71	1.28	0.97	0.98	1.22	1.50	1.29
2	Raw materials	2.09	1.63	1.52	1.40	1.16	1.24	1.33	1.48
3	Ores & other minerals	0.19	0.17	0.15	0.12	0.13	0.11	0.13	0.14
4	Fuels	1.36	1.16	0.98	0.97	1.04	1.03	1.28	1.12
5	Non-ferrous metals	0.55	0.58	0.55	0.48	0.48	0.47	0.43	0.51
6	Iron & steel	0.29	0.37	0.26	0.26	0.36	0.33	0.46	0.33
7	Pharmaceuticals	0.06	0.06	0.04	0.04	0.03	0.03	0.03	0.04
8	Other chemicals	0.47	0.45	0.36	0.45	0.54	0.52	0.56	0.48
9	Other semi-manufactures	0.77	0.66	0.54	0.51	0.52	0.52	0.52	0.58
10	EDP & office equipment	2.64	2.88	3.27	3.35	3.17	3.47	2.98	3.11
11	Telecom equipment	3.58	3.18	2.52	2.54	2.72	2.34	2.11	2.71
12	IC & electronic components	4.92	5.11	4.53	3.69	4.32	4.98	5.21	4.68
13	Automotive products	0.05	0.05	0.04	0.03	0.03	0.03	0.03	0.04
14	Other transport equipment	0.54	0.57	0.30	0.17	0.13	0.16	0.14	0.29
15	Power generating machinery	0.41	0.40	0.35	0.31	0.33	0.34	0.28	0.35
16	Non-electrical machinery	0.29	0.33	0.24	0.26	0.29	0.27	0.29	0.28
17	Electrical machinery	0.98	1.16	0.94	0.96	1.01	1.01	1.02	1.01
18	Textiles	0.55	0.51	0.44	0.46	0.42	0.38	0.36	0.45
19	Clothing	0.90	0.94	0.78	0.71	0.69	0.64	0.60	0.75
20	Personal & household goods	0.73	0.72	0.66	0.68	0.64	0.65	0.65	0.68
21	Scientific & controlling inst.	0.44	0.36	0.30	0.40	0.59	0.61	0.60	0.47
22	Miscellaneous manufactures	0.66	0.63	0.53	0.57	0.61	0.62	0.65	0.61
23	Other products	0.42	0.33	0.29	0.27	0.37	0.45	0.40	0.36

Source: Author's calculation based on UN Comtrade database.

4.5.4 Philippines

Among the ASEAN-5, the Philippines is the only nation that seriously experienced declining competitiveness in most of its merchandise exports over the period studied. In 1997, this country had seven revealed comparative advantage product groups, in which six of them were in manufacturing sector. However, only half of that still maintained comparative advantage in the world market in 2003, which were electronic data processing and office equipment (increasing trend), integrated circuit and electronic components (increasing trend), and clothing (declining trend).

The industries that lost comparative advantage were telecommunications equipment, and personal and household goods (both from 1999); while the electrical machinery, and ores and other minerals groups turned to be comparative disadvantage in 2003 and 1998 respectively.

Table 4.5: Philippines' RCA in the World Market by Product Group, Calculated at 3-digit SITC Level, 1997 to 2003

No.	Product Group	1997	1998	1999	2000	2001	2002	2003	1997-2003
1	Food	0.94	0.83	0.42	0.52	0.57	0.51	0.65	0.63
2	Raw materials	0.47	0.32	0.26	0.28	0.30	0.26	0.30	0.31
3	Ores & other minerals	1.17	0.79	0.75	0.70	0.70	0.65	0.68	0.78
4	Fuels	0.23	0.10	0.10	0.13	0.09	0.14	0.19	0.14
5	Non-ferrous metals	0.83	0.42	0.47	0.43	0.61	0.44	0.58	0.54
6	Iron & steel	0.07	0.04	0.03	0.03	0.02	0.02	0.02	0.03
7	Pharmaceuticals	0.08	0.05	0.03	0.02	0.03	0.02	0.02	0.04
8	Other chemicals	0.29	0.15	0.09	0.10	0.12	0.11	0.12	0.14
9	Other semi-manufactures	0.29	0.26	0.20	0.24	0.23	0.19	0.20	0.23
10	EDP & office equipment	3.09	2.79	2.64	2.88	3.59	3.65	3.48	3.16
11	Telecom equipment	1.39	1.02	0.58	0.61	0.69	0.63	0.53	0.78
12	IC & electronic components	9.35	11.83	10.35	8.10	9.18	9.96	10.46	9.89
13	Automotive products	0.17	0.13	0.12	0.15	0.19	0.21	0.27	0.18
14	Other transport equipment	0.22	0.09	0.12	0.11	0.18	0.15	0.17	0.15
15	Power generating machinery	0.08	0.05	0.07	0.01	0.03	0.04	0.03	0.04
16	Non-electrical machinery	0.11	0.16	0.11	0.14	0.14	0.13	0.15	0.13
17	Electrical machinery	1.05	1.23	1.01	1.13	0.99	1.01	0.73	1.02
18	Textiles	0.45	0.33	0.24	0.26	0.28	0.27	0.27	0.30
19	Clothing	2.82	2.36	1.78	1.96	2.14	1.95	1.85	2.12
20	Personal & household goods	1.37	1.09	0.75	0.81	0.83	0.64	0.56	0.86
21	Scientific & controlling inst.	0.20	0.17	0.15	0.14	0.15	0.22	0.14	0.17
22	Miscellaneous manufactures	0.57	0.47	0.30	0.38	0.49	0.49	0.63	0.48
23	Other products	0.35	0.27	0.16	0.13	0.09	0.09	0.11	0.17

Source: Author's calculation based on UN Comtrade database.

The Philippines' economy appears to specialise in producing and exporting higher value-added and technology-intensive products. In 2003, the product groups that this country had strong competitiveness were: transistors, valves etc. (RCA 11.5); automatic data processing equipment (RCA 4.2); parts for office machines (RCA 3.6); radiobroadcast receiver (RCA 1.3); electrical distributor equipment n.e.s (RCA 2.5); electrical switch relay circuit (RCA 1.1); watches and clocks (RCA 1.4); optical goods n.e.s (RCA 1.2); photograph apparel etc. n.e.s (RCA 4.4); wood manufactures (RCA 1.6) and trunk, suitcases, bags, etc. (RCA 1.3). In clothing, there were: men, boys clothing, x-knit (RCA 2.2); women, girls clothing, x-knit (RCA 3.2); men, boys clothing knit (RCA 3.7); women, girls clothing knit (RCA 2.3) and other textile apparel n.e.s (RCA 1.3). In agriculture, there were: fixed vegetable fats, oils, other (RCA 10.6); animal, vegetable fats, oils n.e.s (RCA 1.2); crustacean, molluscs etc. (RCA 2.6); fish etc. prepared, preserved n.e.s (RCA 2.6); fuel wood, wood charcoal (RCA 2.9); vegetable textile fibres (RCA 2.7) and natural rubber, etc. (RCA 1.1). In fuels and mining products, there were: nickel ore, concentrate matter (RCA 3.1); iron

ore, concentrates (RCA 1.2); precious metal ores, concentrates (RCA 1.1); non-ferrous waste, scrap (RCA 1.1); copper (RCA 2.0) and miscellaneous non-ferrous base metal (RCA 1.8).

4.5.5 Thailand

While the Philippines appears to focus on export product specialisation, Thailand seems to concentrate on producing diversified export products. Among the ASEAN-5, Thailand emerged to be the most industrialised country with ten revealed comparative advantage product groups in manufacturing sector in 1997. The number of competitive product groups, although declining to seven at the end of the period studied, was still highest among the ASEAN-5. These seven groups were electronic data processing and office equipment, telecommunications equipment, integrated circuit and electronic components, electrical machinery, textiles, clothing, and personal and household goods.

Of these seven comparative advantage manufacturing product groups, some experienced an increasing trend in competitiveness, some suffered the reverse. The former groups were integrated circuit and electronic components, and electrical machinery and the latter groups were electronic data processing and office equipment, telecommunications equipment, textiles, clothing, and personal and household goods. The three product groups in manufacturing sector that had comparative advantage in 1997 but no longer did in 2003 were power-generating machinery (lost in 1998), miscellaneous manufactures (in 1999) and other products (in 2000).

In agriculture, food and raw materials maintained their competitiveness during this period; however, the former slightly decreased its competitiveness from 2.5 in 1997 to 2.0 in 2003 whereas the latter increased its RCA from 1.7 to 2.6 over the same period. From 1990, Thailand turned to exporting more technologically sophisticated higher value-added products such as office machines (SITC 751), parts for office machines (SITC 759), television receivers (SITC 761), sound recorders (SITC 763) and transistors and valves (SITC 776).

Table 4.6: Thailand's RCA in the World Market by Product Group, Calculated at 3-digit SITC Level, 1997 to 2003

No.	Product Group	1997	1998	1999	2000	2001	2002	2003	1997-2003
1	Food	2.46	2.60	2.33	2.26	2.24	2.08	1.96	2.28
2	Raw materials	1.95	1.79	1.60	1.78	1.72	2.07	2.60	1.93
3	Ores & other minerals	0.50	0.55	0.56	0.70	0.53	0.65	0.51	0.57
4	Fuels	0.40	0.29	0.26	0.32	0.30	0.32	0.34	0.32
5	Non-ferrous metals	0.23	0.26	0.25	0.30	0.28	0.29	0.27	0.27
6	Iron & steel	0.34	0.40	0.42	0.53	0.41	0.48	0.51	0.44
7	Pharmaceuticals	0.13	0.10	0.07	0.08	0.07	0.06	0.05	0.08
8	Other chemicals	0.53	0.57	0.57	0.69	0.72	0.74	0.71	0.65
9	Other semi-manufactures	0.96	0.93	0.83	0.87	0.89	1.01	0.90	0.91
10	EDP & office equipment	2.39	2.67	2.27	2.03	2.05	2.01	1.91	2.19
11	Telecom equipment	1.56	1.46	1.11	1.12	1.06	1.36	1.29	1.28
12	IC & electronic components	1.57	1.57	1.53	1.65	1.73	1.82	1.91	1.68
13	Automotive products	0.17	0.20	0.28	0.35	0.40	0.42	0.45	0.32
14	Other transport equipment	0.47	0.19	0.18	0.24	0.20	0.26	0.57	0.30
15	Power generating machinery	1.02	0.78	0.73	0.74	0.67	0.93	0.61	0.78
16	Non-electrical machinery	0.49	0.49	0.43	0.46	0.50	0.57	0.51	0.49
17	Electrical machinery	1.25	1.28	1.21	1.24	1.22	1.41	1.30	1.27
18	Textiles	1.17	1.11	1.02	1.00	1.03	1.06	1.00	1.06
19	Clothing	1.94	1.94	1.72	1.67	1.61	1.52	1.37	1.68
20	Personal & household goods	1.73	1.58	1.42	1.39	1.37	1.36	1.13	1.43
21	Scientific & controlling inst.	0.32	0.32	0.22	0.21	0.23	0.27	0.22	0.26
22	Miscellaneous manufactures	1.19	1.09	0.91	0.90	0.98	1.11	0.99	1.02
23	Other products	1.24	0.88	1.06	0.80	1.22	1.24	0.88	1.05

Source: Author's calculation based on UN Comtrade database.

In 2003, Thailand had seventy-seven comparative advantage product groups exporting to the world market, in which fifty-seven groups were classified in manufacturing sectors. It can be seen easily from Table 4.7 showing general characteristics as well as the changing patterns of revealed comparative advantage for these product groups, at the two far-off points in time: 1980 and 2003 (1997 and 2003 for Vietnam), that all the ASEAN-5 originally were agro-intensive economies as they all enjoy a revealed comparative advantage greater than one in producing and exporting agricultural products,[32] except for Indonesia in food.

[32] Agricultural products consist of food and raw materials. Specifically, agricultural products contain SITC sections 0, 1, 2, 4 minus divisions 27 and 28 (Revision 3).

Table 4.7: ASEAN-5 Comparative Advantage of Selected Product Groups, 1980 and 2003

	Indonesia		Malaysia		Philippines		Thailand		Vietnam	
	1980	2003	1980	2003	1980	2003	1980	2003	1997	2003
Food	0	X	X	X	X	0	X	X	X	X
Raw materials	X	X	X	X	X	0	X	X	X	X
Ores & other minerals	0	X	0	0	X	0	X	0	0	0
Fuels	X	X	X	X	0	0	0	0	X	X
Non-ferrous metals	0	X	X	0	0	0	X	0	0	0
Iron & steel	0	0	0	0	0	0	0	0	0	0
Pharmaceuticals	0	0	0	0	0	0	0	0	0	0
Other chemicals	0	0	0	0	0	0	0	0	0	0
Other semi-manufactures	0	X	0	0	0	0	0	0	0	0
EDP & office equipment	0	0	0	X	0	X	0	X	0	0
Telecom equipment	0	X	0	X	0	0	0	X	0	0
IC & electronic components	0	0	X	X	0	X	0	X	0	0
Automotive products	0	0	0	0	0	0	0	0	0	0
Other transport equipment	0	0	0	0	0	0	0	0	0	0
Power generating machinery	0	0	0	0	0	0	0	0	0	0
Non-electrical machinery	0	0	0	0	0	0	0	0	0	0
Electrical machinery	0	0	0	X	0	0	X	X	0	0
Textiles	0	X	0	0	0	0	X	X	0	0
Clothing	0	X	0	0	X	X	X	X	X	X
Personal & household goods	0	X	0	0	X	0	0	X	X	X
Scientific & controlling inst.	0	0	0	0	0	0	0	0	0	0
Miscellaneous manufactures	0	0	0	0	0	0	0	X	0	0
Other products	0	0	0	0	X	0	X	0	X	0

Notes: 1. Vietnam's data are not available for 1980; hence 1997's data are used instead.
2. X indicates the presence of revealed comparative advantage, and 0 denotes its absence.

In 1980, Indonesia had only two revealed comparative advantage product groups in raw materials and fuels; however, the number increased to ten in 2003. Besides these two product groups have maintained their competitiveness in the global market, the other groups gaining comparative advantages were food, ores and other minerals, non-ferrous metals, other semi-manufactures, telecommunications equipment, textiles, clothing, and personal and household goods.

Malaysia produced five comparative advantage product groups in 1980. Twenty-three years later, four groups still maintaining their competitiveness were food, raw materials, fuels, and integrated circuit and electronic components. Three groups gaining comparative advantages were electronic data processing and office equipment, telecommunications equipment and electrical machinery; and one group became comparative disadvantage was non-ferrous metals.

The Philippines gained six comparative advantage product groups in 1980. However, five no longer had competitiveness in the world market in 2003. These groups were food, raw materials, ores and other minerals, personal and household goods, and other products. In return, the Philippines has gained comparative advantage in two high value-added product groups, which were electronic data processing and office equipment, and integrated circuit and electronic components. Clothing was the product category that has maintained its competitiveness in the world market.

In 1980, Thailand had eight revealed comparative advantage product groups; five of them have maintained competitiveness in 2003, which were food, raw materials, electrical machinery, textiles and clothing. The three groups became comparative disadvantage were ores and other minerals, non-ferrous metals and other products; however Thailand gained comparative advantage in high value-added product groups such as electronic data processing and office equipment, telecommunications equipment, and integrated circuit and electronic components.

Between 1997 and 2003, Vietnam lost competitiveness in one product group, mainly special transaction not classified (SITC 931) in the last group. Besides, there was no substantial change in the number of revealed comparative advantage industries that Vietnam exported to the world. Among the other five comparative advantage product groups, three were in the primary and resource-based sector and two in low value-added labour-intensive manufacturing sector. The former were food, raw materials and fuels; and the latter were clothing, and personal and household goods.

It is noticeable that Malaysia, the Philippines and Thailand have quickly modified their economic structures towards high-tech manufacturing sector by producing high value-added products such as electronic data processing and office equipment, telecommunications equipment, integrated circuits and electronic components, and electrical machinery, whereas Indonesia and Vietnam still specialise in natural resource-based and low-tech, low value-added industries like textiles, clothing, and personal and household goods. Obviously, after the success of the first-tier NICs was initiated in the mid 1960s, there came the second-tier that has shifted countries like Malaysia, the Philippines and Thailand from producing and exporting labour-intensive to capital and technology-intensive products; and the approaching 'third-

tier' of Indonesia and Vietnam have also shifted their exports from primary and natural resources to labour-intensive manufactured products.

4.6 Changing Structure of the ASEAN-5's Trade Performance and Comparative Advantage in Merchandise Exports

As stated by Chow and Kellman (1993; 64):

> As a country progresses, the commodity composition of its exports will change according to its changing comparative advantage. Hence, the pattern of trade and the resultant division of labour will be subject to dynamic change in a rapidly growing economy. The earliest stage is associated with a reliance of exports of primary products. The second stage consists of a shift to exports of products closely associated with the available raw material. The third stage consists of the exports of simple, labour-intensive consumer goods. The fourth stage sees a shift to more sophisticated capital goods; finally there is a shift to R&D, or technology-intensive goods.

To illustrate the changing dynamics of comparative advantage of the ASEAN-5's world markets as discussed earlier, the RCA indices were used as an indicator to compare the relative competitiveness of the ASEAN-5's merchandise exports. If a country experiences considerable dynamic changes in its trade performance, then its RCA indices between the two periods of time would tend to be less significantly correlated with each other. The non-parametric technique of Spearman[33] is applied to rank the correlation coefficients between the two time periods of each country's RCA indices in order to evaluate the degree of changing competitiveness of the ASEAN-5 during the period studied. The year of 2003 is used as the base year to compare with 1997, 1998, 1999, 2000, 2001 and 2002. Due to lack of available data for Vietnam before 1997, the tests are limited to a 6-year interval and thus the results do not fully produce apparent inferences about changing competitiveness of the ASEAN-5's

[33] The Spearman's rank correlation coefficient is given by the following equation:

$$r_s = 1 - \frac{6\sum d^2}{N(N^2-1)}$$

r_s is the Spearman's rank correlation coefficient; N denotes the number of observations or product categories; and d is the difference between any pair of RCAI ranking of two countries. If the RCAI ranking of two countries is the same, then the r_s will be unity.

exports in world markets. However, these results are still useful as supplemental evidence of what has recently been discussed above. It is noted that the number of observations in these analytical tests is each country's 247 three-digit SITC product categories rather than the twenty-three product groups as discussed in the earlier section. The results are shown in the following Table 4.8, and these figures are extracted from Table Appendix A4.3.

Table 4.8: Spearman Rank Correlation Coefficients between RCA Indices for 2003 and the Specific Year Indices for the ASEAN-5 in the World Market (N= 247*)

	Indonesia	Malaysia	Philippines	Thailand	Vietnam
1997	0.858**	0.873**	0.835**	0.904**	0.761**
1998	0.735**	0.783**	0.808**	0.804**	0.642**
1999	0.891**	0.914**	0.883**	0.920**	0.820**
2000	0.918**	0.930**	0.903**	0.934**	0.848**
2001	0.898**	0.923**	0.902**	0.931**	0.878**
2002	0.937**	0.956**	0.952**	0.962**	0.944**

Notes: * N = number of observations (247 product categories at 3-digit SITC level, revision 3).
** Correlation is significant at 0.01 level.
SPSS outputs of these tests are attached in Table A4.3 of Appendix Tables.
Source: Author's calculation.

It is evident that between 1997 and 2003, Vietnam experienced the most intensive structural conversion in its pattern of changing competitiveness, varying from 0.761 to 0.944. This proves that the competitive position of Vietnam's exports in 2003 was very much different from what it was in 1997, and even more so if compared to the years prior to 1997. It should be emphasised here that this type of test only proves the degree of changing competitiveness of a country between two periods of time, but can not verify whether the changing pattern of RCA product groups is beneficial or unfavourable to that country's long-term growth. However, this issue will be meticulously discussed in Section 4.7 of this chapter.

Vietnam's 1997 pattern of revealed comparative advantage was less correlated with its respective 2003 pattern than was the case for the other countries. This corresponds with the earlier discussion that Vietnam rapidly shifted a substantial proportion of its export products from natural resource-based to low value-added labour-intensive manufactured products. Specifically, the RCA value of food and raw materials decreased from 3.75 and 1.50 to 3.33 and 1.35 respectively between 1997 and 2003 (see Table 4.2). In the same period, clothing increased its competitiveness in the world market with an increase of revealed comparative advantage from 4.56 to 5.23,

and personal and household goods also raised from 4.76 to 5.53. Textiles was comparative disadvantage with RCA value of 0.52 in 1997; however gained comparative advantage in 1999 with RCA value of 1.06, although its RCA gradually declining in the following years but still very high compared with the initial year 1997.

The Philippines was the second fastest nation experiencing structural transformation in export competitiveness over the same period; however, this transformation appeared to be negative with a declining trend in competitiveness. Whereas only a few product groups increased comparative advantage in the world market such as integrated circuit and electronic components, from 9.35 to 10.46; electronic data processing and office equipment from 3.09 to 3.48; the competitiveness in many others has declined over time. For instance, the RCA for telecommunications equipment decreased from 1.39 to 0.53, electrical machinery from 1.05 to 0.73, clothing from 2.82 to 1.85, ores and other minerals from 1.17 to 0.68, food from 0.94 to 0.65, textiles from 0.45 to 0.27 and non-ferrous metals from 0.83 to 0.58 etc.

Over the period studied, the Philippines gained only three new revealed comparative advantage product groups, but twenty-two product groups became comparative disadvantage by 2003.

Among the ASEAN-5, Malaysia's and Thailand's pace of changing competitiveness was moderate over this period. Although positively skewed to capital-intensive and technology-intensive products, the general competitive trend of their merchandise exports has declined over time. Generally speaking, the moving structure in the pattern of comparative advantage exports of Malaysia, the Philippines and Thailand changed from the mid 1980s to producing higher value-added products such as machinery and transport equipments, and office and telecommunications equipments.

The country that experienced the least structural changes in exports competitiveness was Indonesia, since its Spearman rank correlation coefficients of RCA indices in 1997 and 2003 were significantly correlated with each other at the values of 0.858 and 0.937 respectively. It is noted that Indonesia's number of revealed comparative advantage product categories increased by sixteen new product groups in 2003

(gained twenty-three and lost seven product groups), and amounted to sixty-one in that year, the second highest after Thailand (seventy-seven). In 1997, these numbers were forty-five for Indonesia and seventy-six for Thailand. It thus appeared that Indonesia and Thailand have diversified their export products to the world market. The more diversified exports an economy focuses on, the less specialised will be its products due to scarcity in human resources (skills, knowledge, technology etc.) and physical resources (capital, infrastructure etc.), and thus, the less positive change in its product values of revealed comparative advantage.

Worth noting is that there were two negative events, which occurred in the world economy during the period studied, the Asian financial crisis in 1998 and the world economy slackness in 2001 due to a slump in the US economy, usually seen as a prime locomotive of world trade activities. Observing the figures in Table 4.8 above, one will notice that there was a drop in the Spearman rank correlation coefficients for all the ASEAN-5 in association with the former event in 1998. As for the latter event in 2001, these coefficients also dropped again from the prior year with the exception of Vietnam, whose coefficients positively skewed more towards the base year of 2003. This implies that the latter event did not affect Vietnam as bad as the ASEAN-4. In fact, according to WTO statistics database, the export growth rates recorded in 2001 for the ASEAN-5 as follows: Indonesia (–12 per cent), Malaysia (–10 per cent), the Philippines (–18 per cent), Thailand (–6 per cent) and Vietnam (4.0 per cent). This would raise another question why Vietnam was not badly affected, and even fully escaped the world economy slowdown in 2001? This question will be answered in the next chapter when the constant market share model is applied to investigate the ASEAN-5's sources of annual export growth for the 1997-2006 period.

4.7 ASEAN-5's Changing RCA Patterns: Favourable or Not?

As stated in the introduction: 'a country will only sustain high economic growth if its merchandise exports to the global market are produced from the world rapidly growing industries; otherwise there is nothing to assure such a sustained high growth in the long run' (Lam 2009: 90). Given the above results, it is useful for this section to examine whether the changing patterns of the ASEAN-5's RCAs were beneficial in the long run. Indeed, it is favourable only for a country's sustainable high growth if it gains comparative advantage in the product categories for which the demands of world markets are growing relatively fast.

The Spearman's rank correlation coefficients are used again to test the relationship between the two vectors: ASEAN-5's RCA vectors and world export growth vectors. As the two-digit HS (2002) level of 97 product categories for 2001-2006 are available from the UNCTAD/WTO database, where Vietnam's data have been collected from the mirror statistic method. This non-parametric analysis test consists of two periods: 1997-2001 using the average world export growth and RCA indices of the twenty-three product groups aggregated from 247 product categories at the three-digit SITC (Rev.3) level as discussed in Section 4.5; and 2001-2006 using the average world export growth and RCA indices of 97 product categories at the two-digit HS (2002) level.

A positive correlation between changes in the RCA vectors and world export growth vectors for a particular country of the ASEAN-5 over the period studied implies that this country had successfully gained comparative advantage in the rapidly growing industries in world trade. Conversely, a negative correlation indicates that the country gained comparative advantage in the world slow-growing industries.

For all the ASEAN-5 countries, results in Table 4.9 indicate that over 1997-2001, changes in comparative advantage were negatively and statistically correlated with the average world export growth vector. This means that these changes were not consistent with the general trends in world trade. In other words, the ASEAN-5 countries were not able to gain comparative advantage in the more rapidly growing

industries in world trade, and thus the changing structures of comparative advantage exports were not necessarily beneficial for the country's long-term growth. For example, let us look at Table 4.10 below, while the average annual world export growth of the product groups such as miscellaneous manufactures, other transport equipment, power generating machinery, non-electrical machinery, scientific and controlling instrument, pharmaceuticals and automotive products were relatively high – at 6 per cent, 10 per cent, 16 per cent, 6 per cent, 11 per cent, 20 per cent and 7 per cent respectively – the ASEAN-5's corresponding industries experienced all comparative disadvantages. Particularly for Vietnam and Indonesia, with the exception of the average world high growth of 19 per cent in fuels, these two countries gained comparative advantage in product groups which experienced very slow growth of world demand in personal and household goods, clothing, food, raw materials, other products and textiles.

Table 4.9: Spearman Rank Correlation between Average Changes in RCA Vectors and World Export Growth, 1997-2001 and 2001-2006

	Indonesia	Malaysia	Philippines	Thailand	Vietnam
1997-2001	-0.511*	-0.015	-0.149	-0.389	-0.358
2001-2006	0.048	0.198	0.048	-0.156	-0.144

Notes: * Correlation is significant at the 0.05 level (2-tailed).
Outputs are attached in Table A4.4 of Appendix Tables.
Source: Author's calculation based on UN Comtrade database.

Among the ASEAN-5, it is noticeable that although negatively, Malaysia's Spearman rank correlation coefficient (–0.015) was higher correlated than the others because this country had more comparative advantage product groups in the world high growing industries than the others. These industries are high value-added capital and technology-intensive ones such as electronic data processing and office equipment, telecommunications equipment, integrated circuit and electronic components, and electrical machinery.

Over 2001-06, changes in Malaysia's comparative advantage product groups were also more favourable than the others, because its correlation coefficient (0.198) was positively higher than the rest of the ASEAN-5. This implies that Malaysia gained comparative advantage in export industries whose world markets were growing rapidly. While Indonesia and the Philippines had little improved with their correlation

coefficient (0.048) turning to positive albeit statistically insignificant, the situation in Vietnam and Thailand remained unchanged with negative correlation as in the previous period, albeit a little improved by skewing toward positive direction.

Table 4.10: ASEAN-5's Average RCA and World Export Growth, 1997-2001

Product Group	Vietnam RCAs	Indonesia RCAs	Malaysia RCAs	Philippines RCAs	Thailand RCAs	World export growth (%)
Personal & household goods	4.8	1.71	0.68	0.86	1.43	4.5
Clothing	4.33	1.97	0.75	2.12	1.68	3.5
Food	3.66	1.4	1.29	0.63	2.28	1.4
Fuels	2.74	3.08	1.12	0.14	0.32	18.6
Raw materials	1.18	2.14	1.48	0.31	1.93	-0.3
Other products	1.03	1.65	0.36	0.17	1.05	2.7
Textiles	0.8	1.75	0.45	0.3	1.06	1.2
EDP & office equipment	0.45	0.5	3.11	3.16	2.19	5.7
Electrical machinery	0.44	0.46	1.01	1.02	1.27	6.9
Other semi-manufactures	0.43	1.43	0.58	0.23	0.91	6.0
Miscellaneous manufactures	0.39	0.51	0.61	0.48	1.02	6.3
Ores & other minerals	0.34	3.23	0.14	0.78	0.57	1.8
Telecom equipment	0.19	0.93	2.71	0.78	1.28	11.8
Other transport equipment	0.16	0.17	0.29	0.15	0.3	9.7
Power generating machinery	0.16	0.3	0.35	0.04	0.78	15.6
Other chemicals	0.15	0.56	0.48	0.14	0.65	2.9
IC & electronic components	0.14	0.18	4.68	9.89	1.68	7.6
Iron & steel	0.11	0.33	0.33	0.03	0.44	0.5
Non-ferrous metals	0.09	0.83	0.51	0.54	0.27	3.6
Non-electrical machinery	0.09	0.11	0.28	0.13	0.49	5.5
Scientific & controlling inst.	0.07	0.04	0.47	0.17	0.26	11
Pharmaceuticals	0.03	0.05	0.04	0.04	0.08	20.4
Automotive products	0.01	0.06	0.04	0.18	0.32	6.8

Source: Author's calculation based on UN Comtrade database.

Since the test includes 97 two-digit product categories at HS-2002 level over this period, a similar table like Table 4.10 is not possible to present here, however the Appendix Table A4.2 is enclosed in the list of Appendix Tables consisting of the following details: exports value (US$ million), exports as a share of total exports (%), exports as a share of world exports (%), growth of world exports in value (% per annual), number of exported products (value > US$100,000), number of export markets (value > US$100,000), net trade and Balassa's specialisation index (RCAI).

4.8 ASEAN-5's Top-20 Exports Classified by Industry Intensity

The following Table 4.11 shows all the ASEAN-5's top twenty export product categories in 2003, ranked by their export value and their share of total exports in descending order. These commodities are classified into four industry groups by Hatzichronoglou (1997) according to their relative factor intensities. The concept of technology intensity has been expanded to take into account both the level of technology specific to the sector (measured by the ratio of R&D expenditure to value-added) and the technology embodied in purchases of intermediate and capital goods. Four groups of manufacturing industry were identified as low-technology,[34] medium-low-technology,[35] medium-high-technology[36] and high-technology.[37] According to Hatzichronoglou (1997: 5):

> Industries that devote a high proportion of their turnover or production to R&D also make use of the most advanced equipment and intermediates. For such industries, there is a strong ranking between direct intensity (production of technology) and indirect intensity (use of technology). Industries in a high group are more R&D-intensive than those in a lower group over a long period. The distinction between the medium-high and medium-low groups, and between the medium-low-and low groups, is more clear-cut when R&D intensity is calculated in terms of production than when it is calculated in terms of value added. In both cases, the cut-off points provide stability over time and median stability across countries.

Besides, the natural resource-based industries are added to form the fifth group, which consists of all product categories within SITC section 0-4 (revision 3).

[34] This group consists of such industries as paper printing; textile and clothing; food, beverages, and tobacco; and wood and furniture.

[35] Included in this group are rubber and plastic products; shipbuilding; other manufacturing; non-ferrous metals; non-metallic mineral products; fabricated metal products; petroleum refining; and ferrous metals.

[36] These are scientific instruments; motor vehicles; electrical machinery; chemicals; other transport equipment; and non-electrical machinery.

[37] This group includes aerospace; computers, office machinery; electronics, communications; and pharmaceuticals.

Again, by looking at the ASEAN-5's top-twenty exports share of total exports, one can see the characteristics of a country's either specialisation or diversification. The higher the share of these top-twenty exports in total exports, the more specialisation the country is. On the contrary, the lower this share is, the more diversification the country progresses. In this sense, it appears that the production and export specialisation occurred in Malaysia, the Philippines and Vietnam with the top-twenty export product categories accounted for 75 per cent, 86 per cent and 79 per cent of total exports respectively. Meanwhile, Thailand has more diversified its export industries with 54 per cent compared to 63 per cent for Indonesia.

Table 4.11: ASEAN-5's Top-20 Exports Ranked by RCAs, Values and Intensity Classification in 2003

Indonesia				Malaysia				Philippines			
	Export Value (US$b)	*% of total exports*	*RCA*		*Export Value (US$b)*	*% of total exports*	*RCA*		*Export Value (US$b)*	*% of total exports*	*RCA*
Natural gas (N)	6.1	10.4	10.2	Transistors, valves, etc. (HT)	22.4	21.6	5.5	Transistors, valves etc. (HT)	15.9	45.1	11.5
Petroleum oil, crude (N)	5.6	9.5	2.8	Auto. data proc. equip (HT)	8.4	8.1	2.9	Auto. data proc. equipment (HT)	4.1	11.7	4.2
Fixed vegetable, fats, oils (N)	2.9	4.8	35.7	Parts, for office machines (HT)	8.3	8.0	3.7	Parts, for office machines (HT)	2.8	7.9	3.6
Coal, not agglomerated (N)	2.0	3.3	12.2	Telecom. equip., parts, nes (HT)	5.2	5.0	1.6	Parts, tractors, motor vehicles (MH)	0.9	2.6	1.0
Veneers, plywood, etc. (N)	1.9	3.3	10.7	Fixed vegetable, fats, oils (N)	5.0	4.8	35.5	Women, girl, clothing, x-knit (LT)	0.8	2.2	3.2
Copper ores, concentrates (N)	1.9	3.1	33.7	Petroleum oil, crude (N)	4.2	4.0	1.2	Telecom. equip., parts, nes (HT)	0.8	2.2	0.7
Furniture, cushions, etc. (LT)	1.6	2.6	2.4	Natural gas (N)	3.5	3.4	3.4	Elec. switch relay circuit (HT)	0.6	1.7	1.1
Petroleum products (N)	1.5	2.6	1.2	Elec. switch relay circuit (HT)	3.1	3.0	2.0	Elec. dist. equip. nes. (MH)	0.6	1.6	2.6
Natural rubbers, etc (N)	1.5	2.5	30.8	Petroleum products (N)	2.2	2.1	1.0	Petroleum products (N)	0.5	1.5	0.7
Telecom. Equip., parts, nes (HT)	1.4	2.4	0.7	Sound recorder, phonograph (HT)	1.9	1.8	3.4	Fixed vegetable, fats, oils (N)	0.5	1.4	10.6
Textile yarn (LT)	1.2	2.1	4.4	Television receivers etc. (HT)	1.8	1.7	3.6	Other textile apparel, nes (LT)	0.5	1.4	1.4
Paper and paperboard (LT)	1.2	2.0	1.7	Furniture, cushions, etc. (LT)	1.6	1.6	1.4	Men, boys, clothing, x-knit (LT)	0.5	1.3	2.2
Footwear (LT)	1.2	2.0	2.6	Radio broadcast receivers (HT)	1.5	1.4	6.8	Photogr. apparatus. nes (HT)	0.4	1.0	4.4
Women, girl, clothing, x-knit (LT)	1.2	2.0	2.8	Veneers, plywood, etc. (N)	1.5	1.4	4.7	Copper (N)	0.3	0.9	2.1
Other textile apparel, nes (LT)	1.1	1.9	1.9	Elec. machine apparatus nes (HT)	1.4	1.3	0.9	Furniture, cushions, etc. (LT)	0.3	0.8	0.7
Men, boys, clothing, x-knit (LT)	1.1	1.8	3.2	Animal veg. fats, oils, nes (N)	1.3	1.2	18.1	Women, girl, clothing, knit (LT)	0.2	0.7	2.3
Sound recorder, phonograph (HT)	1.0	1.6	3.0	Spec. transact. not classified	1.2	1.1	0.4	Men, boys, clothing, knit (LT)	0.2	0.6	3.7
Crustaceans, molluscs etc. (N)	1.0	1.6	7.3	Measure contrl. instrument (HT)	1.2	1.1	0.9	Elec. machine apparatus nes (HT)	0.2	0.6	0.4
Parts, for office machines (HT)	1.0	1.6	0.7	Clothing, non-txtl, headgear (LT)	1.0	0.9	4.0	Crustaceans, molluscs, etc. (N)	0.2	0.6	2.6
Fabrics, man-made fibres (LT)	0.9	1.5	3.6	Natural rubber, etc. (N)	0.9	0.9	11.1	Baby carriage, toys, games (LT)	0.2	0.5	0.7
TOTAL	**37.2**	**62.6**		**TOTAL**	**77.5**	**74.8**		**TOTAL**	**30.4**	**86.2**	

Table 4.11 (continued)

Thailand				Vietnam			
	Export Value (US$b)	*% of total exports*	*RCA*		*Export Value (US$b)*	*% of total exports*	*RCA*
Transistors, valves, etc. (HT)	6.3	8.2	2.1	Petroleum oil, crude (N)	3.8	20.3	6.0
Auto. data proc. equip (HT)	4.5	5.8	2.1	Footwear (LT)	2.3	12.2	16.2
Parts, for office machines (HT)	3.7	4.8	2.2	Crustaceans, molluscs, etc. (N)	1.6	8.7	39.4
Telecom. equip., parts, nes (HT)	2.8	3.6	1.1	Men, boys, clothing, x-knit (LT)	1.1	5.7	10.0
Natural rubber, etc. (N)	2.8	3.6	44.3	Other textile apparel, nes (LT)	0.8	4.4	4.4
Fish etc. prprd, prsvd., nes (N)	2.1	2.8	18.8	Rice (N)	0.7	3.8	43.0
Elec. switch relay circuit (HT)	1.9	2.5	1.7	Furniture, cushions, etc. (LT)	0.6	3.4	3.2
Goods, spcl transport vehicles (MH)	1.9	2.4	2.5	Women, girl, clothing, x-knit (LT)	0.6	3.4	4.9
Rice (N)	1.8	2.4	26.7	Women, girl, clothing, knit (LT)	0.4	2.3	7.8
Spec. transact. not classified	1.8	2.3	0.9	Fish, fresh, chilled frozen (N)	0.4	2.0	5.9
Heating, cooling equip., parts (MH)	1.6	2.1	2.8	Natural rubber, etc. (N)	0.4	2.0	24.5
Elec. machine apparatus nes (HT)	1.3	1.7	1.1	Men, boys, clothing, knit (LT)	0.3	1.7	10.7
Crustaceans, molluscs, etc. (N)	1.3	1.7	7.6	Parts, for office machines (HT)	0.3	1.7	0.8
Gold, silverware jewl nes. (LT)	1.2	1.6	3.6	Elec. dist. equip. nes. (MH)	0.3	1.6	2.5
Other textile apparel, nes (LT)	1.2	1.5	1.5	Trunk, suit-cases, bag, etc. (LT)	0.2	1.3	4.9
Television receivers, etc. (MH)	1.1	1.5	3.0	Coal, not agglomerated (N)	0.2	1.0	3.6
Dom. elec., non-elec. equip. (MH)	1.1	1.4	2.0	Cycles, motorcycles, etc. (ML)	0.2	0.9	2.8
Furniture, cushions, etc. (LT)	1.0	1.4	1.2	Misc. manufactured goods nes. (LT)	0.2	0.9	1.9
Petroleum products (N)	1.0	1.3	0.6	Textile articles nes (LT)	0.2	0.9	2.7
Parts, tractors, motor vehicles (MH)	1.0	1.3	0.5	Auto. data proc. equip (HT)	0.2	0.8	0.3
TOTAL	**41.5**	**53.8**		**TOTAL**	**14.9**	**79.0**	

Note: N= natural resources; LT= low technology; ML= medium-low technology; MH= medium-high technology; H= high-technology.
Source: Author's calculation based on UN Comtrade database and OECD's industrial intensity classification 1997.

Also, another way to assess whether a country's economy is specialised or diversified by looking at the value/share of these top twenty exports to see whether this value/share is concentrated with heavy weight on a few product categories or scattered among the list. With respect to the first top-five exports, while this share for Vietnam, Malaysia and the Philippines in total exports was 51, 48 and 70 per cent respectively, this share for Indonesia and Thailand was 31 and 26 per cent

respectively. The issue of whether a country's specialisation or diversification, however, will be discussed further by using non-parametric method in the next section.

It is noticeable that, among the ASEAN-5, while the share of Vietnam's top twenty exports amounts to 79 per cent of total exports, only second to the Philippines at 86 per cent; Vietnam's export value of these top twenty product categories, at US$15 billion, was only half of the Philippines at US$30 billion; and a little less than the value of the Philippines' first top export category, which was transistors, valves etc. (SITC 776) with US$16 billion. Also, it is noted that Vietnam's largest export category in 2003 was petroleum oil, crude (SITC 333) with 20 per cent of total exports, while this share for Indonesia and Malaysia was 10 and 4 per cent respectively. Meanwhile, the Philippines and Thailand exported only petroleum products (SITC 334), whose share in total exports was 1.5 and 1.3 per cent respectively in the same year.

In addition, the share of these top twenty exports can also be used to determine whether a country is industrialised or still in developing stage. The former shows the majority of product categories in the list belonging to medium-high or high-technology industries as in the case of Malaysia, the Philippines and Thailand; and the latter is confirmed by showing a large share on natural resource-based and low-technology industries as in the case of Indonesia and Vietnam. It is noted that, within the list of the ASEAN-5's top twenty exports, Malaysia and Thailand were the two countries having comparative advantage of all high-technology exports.

As noted above, Indonesia's and Vietnam's economies are characterised by being more adept at products with low value-added in natural resources and low-technology intensity than Malaysia, the Philippines and Thailand. Within the top twenty exports, which accounted for nearly 80 per cent of total exports in 2003, Vietnam's natural resource-based industries contributed 38 per cent, second only to Indonesia with 41 per cent; whereas this contribution for Malaysia, the Philippines and Thailand was 18 per cent, 4 per cent and 12 per cent respectively. Meanwhile, the share of Vietnam's low-technology industries was highest at 36 per cent compared to 16 per cent for

Indonesia, 3.6 per cent for Malaysia and around 7 per cent for the Philippines and Thailand (see Table 4.12).

In 2003, the contribution of Vietnam's low-technology intensive exports in descending order was as follows: footwear (US$2.3 billion, 12 per cent); men, boys clothing x-nit (US$1.1 billion, 6 per cent); other textile apparel, n.e.s (US$0.8 billion, 4 per cent); furniture, cushions etc. (US$0.6 billion, 3 per cent); women, girl clothing x-knit (US$0.6 billion, 3 per cent); women, girl clothing knit (US$0.4 billion, 2 per cent); men, boy clothing knit (US$0.3 billion, 2 per cent); trunk, suit-cases, bag etc. and textile articles, n.e.s (same US$0.2 billion, 1 per cent); and miscellaneous manufactured goods n.e.s (US$0.2 billion, 0.9 per cent).

Table 4.12: ASEAN-5's Top-20 Exports Ranked by Intensity Classification, 2003 (%)

	Natural resource-based industries (1)	Low-tech industries (2)	Medium-low-tech industries (3)	Medium-high-tech industries (4)	High-tech industries (5)	% of Total Exports	Of which Manufacturing (2+3+4+5)
Indonesia	41.2	15.9	0.0	0.0	5.6	62.6	21.5
Malaysia	17.9	3.6	0.0	0.0	53.2	74.7	56.8
Philippines	4.4	7.4	0.0	4.2	70.2	86.2	81.8
Thailand	11.8	6.8	0.0	8.6	26.6	53.8	42.0
Vietnam	37.9	36.1	0.9	1.6	2.5	79.0	41.1

Source: Author's calculation based on UN Comtrade database.

Table 4.12 presents the share of the ASEAN-5's top-twenty exports classified into five groups: (1) natural resource-based; (2) low-technology; (3) medium-low-technology; (4) medium-high-technology; and (5) high-technology. Within the top twenty exports, while all the ASEAN-4 countries had no exports of medium-low-technology industries, Vietnam had 0.9 per cent for cycles, motorcycles etc. (SITC 785). In medium-high-technology exports, Vietnam's share of 1.6 per cent (US$0.3 billion) was for electrical distributor equipment, n.e.s. (SITC 773), while that of the Philippines and Thailand was 4.2 and 8.6 per cent respectively; and Indonesia and Malaysia had no exports for these industries.

With respect to high-technology exports, the Philippines' share was highest at 70 per cent, followed by Malaysia and Thailand at 53 and 27 per cent respectively. Indonesia scored only 5.6 per cent, and Vietnam was even worse with 2.5 per cent for parts for office machines (SITC 759, US$0.3 billion) and automatic data processing equipment

(SITC 752, US$0.2 billion). It is noted that, in 2003, the value of Vietnam's high-technology exports was US$0.5 billion only compared with that of the ASEAN-4 respectively as follows: US$3 billion, US$53 billion, US$25 billion and US$21 billion.

In general, Vietnam's export structure is fairly similar to Indonesia and dissimilar to other countries in the group. In other words, while Vietnam and Indonesia have specialised in natural resource-based and low-technology intensive industries; Malaysia, the Philippines and Thailand have concentrated more on high-technology intensive industries.

With respect to natural resource-based industries, Vietnam's export structure is analogous to that of Indonesia and Thailand, concentrating a great deal in petroleum oil, crude (SITC 333); crustaceans, molluscs etc. (SITC 036); rice (SITC 042); fish, fresh, chilled, frozen (SITC 034); natural rubber (SITC 231) and coal not agglomerated (SITC 321).

However, the issue of whether Vietnam's export structure is convergent or divergent, or in other words, similar or dissimilar to that of the ASEAN-4 will be further investigated in Chapter Six.

4.9 Specialisation versus Diversification

The degree of industrialisation and trade diversification in a country can be represented by the standard deviation and coefficients of variation of its RCA indices over time. Other things being equal, the more highly industrialised the country, the more diversified its export composition will be. Hence the shrinking of the standard deviation of RCA indices over time can illustrate the degree of industrialisation and trade diversification (Balassa, 1979).

In economic terms, the smaller magnitude of both standard deviation and coefficients of variation reflects the fact that the export composition of a well-diversified economy will be hypothetically distributed across the manufacturing sector more evenly in a sense that there will not be a high-weight put on any single merchandise (Srisathaporn, 1997: 263). Indeed, if the RCAs involve extreme values, then the correlation will over-estimate the relationship between them, and thus the result will be biased. Our descriptive statistical tests on standard deviation and coefficients of variation for the ASEAN-5's RCA indices of 247 product categories at the three-digit level of SITC for 1980, 1985, 1990, 1994, 1997, 1999, 2001, 2003 and 2004,[38] show inverse outcomes, expanding instead of shrinking the standard deviation of RCA indices over time for the highly industrialised countries. This is due to extreme high values of RCA indices in some product categories, which dominate, affect and produce deviatory results. In correcting this bias to remove the impact of extreme high values, all 247 product categories have been grouped into sixteen groups[39] and the results presented in Table 4.19 below, indeed supporting Balassa's abovementioned statement.

Table 4.13 and Figure 4.5 illustrate the movements of the ASEAN-5's standard deviation and coefficients of variation of RCAs patterns. For the first ten years of the time series (1980-1990), the Philippines was the most specialised country in the

[38] Vietnam's data are available only from 1997 to 2004.

[39] These sixteen product groups are classified and provided by the WTO database, containing agricultural products, food, fuels and mining products, fuels, manufactures, iron and steel, chemicals, pharmaceuticals, machinery and transport equipment, office and telecommunications equipment, electronic data processing and office equipment, telecommunications equipment, integrated circuits and electronic components, automotive products, textiles, and clothing.

group, experiencing an increasing standard deviation and coefficient of variance the most, from 1.48 and 2.21 to 2.65 and 7.01 respectively. Concurrently, Indonesia and Thailand followed the Philippines' footsteps for the first five years (1980-1985); then changed their policies to exports diversification until the end of the time series.

The next seven years from 1990 to 1997 was a period where all the ASEAN-4 experienced an expansion of their export-diversified patterns towards more industrialisation, as all their standard deviations declined over this period; however the diversified pace of the Philippines' exports was lowest at 11 per cent whereas the others gained around 33 per cent declines in standard deviations.

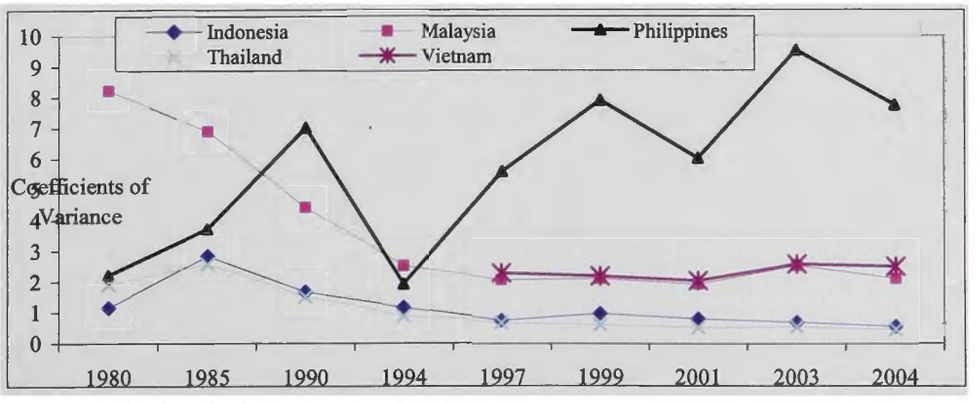
Between 1997 and 2004, while Indonesia and Thailand maintained their export-diversified patterns, Malaysia and especially the Philippines went alone, returning to the old path of export specialisation, especially in high-tech industries.

Table 4.13: ASEAN-5's Standard Deviation and Coefficients of Variance of RCAs, Selected Years

	Indonesia		Malaysia		Philippines		Thailand		Vietnam	
	SD	*COV*	*SD*	*COV*	*SD*	*COV*	*SD*	*COV*	*SD*	*COV*
1980	1.082	1.17	2.870	8.24	1.486	2.21	1.383	1.91	n/a	n/a
1985	1.687	2.85	2.626	6.90	1.925	3.70	1.608	2.59	n/a	n/a
1990	1.287	1.66	2.102	4.42	2.649	7.01	1.228	1.51	n/a	n/a
1994	1.089	1.18	1.583	2.51	1.390	1.93	0.947	0.90	n/a	n/a
1997	0.865	0.75	1.428	2.04	2.361	5.57	0.818	0.67	1.507	2.27
1999	0.983	0.97	1.445	2.09	2.810	7.89	0.773	0.60	1.475	2.17
2001	0.894	0.80	1.383	1.91	2.451	6.01	0.730	0.53	1.420	2.02
2003	0.832	0.69	1.583	2.51	3.085	9.52	0.735	0.54	1.600	2.56
2004	0.745	0.56	1.447	2.09	2.781	7.73	0.677	0.46	1.576	2.48

Note: SD = standard deviation; COV = coefficient of variance (refer to Table A4.5)
Source: Author's calculation based on WTO database.

Figure 4.5: ASEAN-5's Coefficients of Variance of RCAs, Selected Years



Source: Author's calculation based on WTO database.

In general, this non-parametric test supports the results of the ASEAN-5's top-20 exports ranked by industrial intensity classification as in Section 4.8 above. Among the ASEAN-5, Malaysia and the Philippines specialised in high-tech export products while Indonesia and Thailand continued their industrialised path by diversifying their export sector. Indonesia diversified in natural resource-based and low-tech industries, and Thailand diversified in most industries, especially in medium-high-tech and high-tech ones. In the case of Vietnam, it appears that slightly increased standard deviation and coefficient of variance also support earlier findings of a specialisation trend in Vietnam's exports of natural resource-based and low-tech manufacturing industries with 74 per cent in the top-20 export products, which account for 79 per cent of total exports.

Logically, as stated by Srisathaporn (1997: 258), export diversification is preferable to specialisation since the former would alleviate or partially immunise the economy from external shocks relative to the latter. The increasing number of products may or may not concentrate around specific industries for which if it may, it would bring about a more severe consequence to the economy when there is a shock occurring to those industries. On the contrary, a shock on well-distributed exports across products would lead to a less severe damage since the economy does not depend too heavily upon any single commodity and, thus, should be able to recover in a reasonable amount of time.

4.10 Summary and Concluding Remarks

This chapter presents an overall picture of Vietnam's and the ASEAN-4's exports characteristics and trade performance in the world market over the 1997-2003 period (some sections extend to 2005 where Vietnam's data are available), by using the revealed comparative advantage index. Measured by the coefficient of variance of RCA indices at the three-digit SITC level, Vietnam was the most specialised of the ASEAN-5 after the Philippines, and was considerably less diversified than Thailand and Indonesia. Specifically, Malaysia and the Philippines specialised in high-tech export products while Indonesia and Thailand continued their industrialised path by diversifying their export sectors. Indonesia diversified in natural resource-based and low-tech industries; and Thailand diversified in various industries, especially in medium-high-tech and high-tech ones. In the case of Vietnam, it appears that slightly increased standard deviation and coefficient of variance also support a specialisation trend in Vietnam's exports of mainly resource-intensive and low value-added products, in which it is more adept than the second-tier NICs.

The analysis of Vietnam's top-twenty exports at the three-digit level in 2003, which accounted for 79 per cent of total merchandise exports, shows that natural resource-based and low-tech industries contributed 74 per cent, of which natural resource-based industries contributed 38 per cent and low-tech industries 36 per cent. The remaining 5 per cent included 0.9 per cent from medium-low-tech industries, 1.6 per cent from medium-high-tech industries and 2.5 per cent from high-tech industries. By contrast, in the Philippines, Malaysia and Thailand the share in the top-twenty export products contributed by the high-tech industries was 70.2 per cent, 53.2 per cent and 26.6 per cent respectively (see Table 4.12).

Table 4.14 below shows all Vietnam's revealed comparative advantage industries in 2003 in which none of them belonged to high-tech industry, and only one in medium-low-tech (cycles, motorcycles etc.) and another in medium-high-tech industry (electrical distributor equipment n.e.s.).

It should be noted that in Vietnam, and indeed in the ASEAN-4 countries, the production for export of high-tech products substantially consists of low value-added assembly of high-tech inputs from external outsourcing.[40] This does not mean that the category is unimportant, but that it should not be taken to imply high value-added production activities.

Table 4.14: Vietnam's Revealed Comparative Advantage Industries in 2003

SITC	Natural resource-based industries	US$ billion	RCA	SITC	Low-tech industries	US$ billion	RCA
022	Milk and cream	0.067	1.5	592	Starches, Inulin, etc.	0.089	2.6
034	Fish, fresh, chilled, frozen	0.379	5.9	612	Manufactured leather etc. n.e.s.	0.009	1.5
035	Fish, dried, salted, smoked	0.052	7.3	621	Materials of rubber	0.054	2.1
036	Crustaceans, molluscs etc.	1.643	39.4	635	Wood manufactures n.e.s	0.077	1.7
037	Fish etc. prepared, preserved. n.e.s.	0.122	4.4	651	Textile yarn	0.131	1.5
042	Rice	0.720	43.0	658	Textile articles, n.e.s	0.162	2.7
121	Tobacco un-manufactured	0.018	1.3	663	Mineral manufactures, n.e.s	0.143	3.3
122	Tobacco manufactured	0.109	2.7	696	Cutlery	0.027	1.7
222	Oilseed (sft. fix veg. oil)	0.057	1.2	821	Furniture, cushions, etc.	0.644	3.2
223	Oilseed (oth. fix veg. oil)	0.006	2.8	831	Trunk, suit-cases, bag, etc.	0.243	4.9
231	Natural rubber, etc.	0.378	24.5	841	Men, boys clothing, x-knit	1.079	10.0
245	Fuel wood, wood charcoal	0.004	3.8	842	Women, girl clothing, x-knit	0.634	4.4
246	Wood in chips, particles	0.028	5.6	843	Men, boys clothing, k-nit	0.320	10.7
261	Silk	0.002	2.9	844	Women, girls,clothing. knit	0.432	7.8
265	Vegetable textile fibres	0.011	5.0	845	Other textile apparel, n.e.s	0.824	4.4
287	Ore, concentrate base metals	0.048	3.2	846	Clothing accessories, fabric	0.097	2.5
321	Coal, not agglomerated	0.188	3.6	848	Clothing, non-textile; headgear	0.080	1.8
333	Petroleum oils, crude	3.821	6.0	851	Footwear	2.299	16.2
687	Tin	0.009	2.6	899	Misc. manufactured goods n.e.s.	0.174	1.9
	Medium-low-tech industry				**Medium-high-tech industry**		
785	Cycles, motorcycles, etc.	0.177	2.8	773	Elect. distributor equipment n.e.s.	0.292	2.5

Source: Author's calculation based on UN Comtrade database.

In contrast to findings of Chapter Three that Vietnam's export-led growth hypothesis is analogous to the second-tier NICs, the results of this chapter demonstrate that the characteristics of Vietnam's export structure are fairly convergent to Indonesia, a lagger of the ASEAN-4, and divergent to the second-tier NICs. In other words, while Vietnam's and Indonesia's export structures have specialised in the natural resource-based and low-technology intensive industries, those of Malaysia, the Philippines and

[40] According to Athukorala (2003: 6), production outsourcing practices were initiated by multinational enterprises (MNEs) based in the USA. The involvement of Japanese and Western European MNEs in outsourcing began to gain importance from the late 1970s. More recently, MNEs from more advanced developing countries, notably those from the East Asian NICs have also joined this process of internationalisation of production. In recent years, outsourcing practices have begun to spread beyond the domain of MNEs. Many companies, which are not parts of MNE networks, now procure components globally through arm's-length trade. Technological innovations in communication have reduced cost of outsourcing, particularly through reduced research costs. At the formative stage of international product fragmentation, outsourcing took predominantly the form of locating small fragments of the production process in a low cost country and re-importing the assembled components to be incorporated in the final product. Over time the fragmentation process has expanded to involve many countries in the assembly process at different stages, resulting in multiple borders crossing of product fragments before getting incorporated in the final product.

Thailand have concentrated more on high-technology intensive industries. Also, the results of non-parametric tests confirm that Vietnam was not able to gain comparative advantage in the more rapidly growing industries in world trade, and thus the changing structure of Vietnam's comparative advantage industries was not necessarily beneficial for the long-term growth of its exports; although Vietnam experienced the most intensive structural conversion in its pattern of changing competitiveness over the period studied.

Generally speaking, with the exception of Indonesia, which still has production development in favour of natural resource-based and low-technology industries, the structure of the ASEAN-4's export patterns has substantially shifted away from low-technology, medium-low-technology and medium-high technology to more sophisticated high-technology intensive industries.

So far, we have witnessed a shift of the ASEAN-5's exports structure from natural resource-based to low-technology industries (in the case of Indonesia and Vietnam), and then to medium-high and high-technology industries as in the case of Malaysia, the Philippines and Thailand. In a later chapter, Chapter Six, we will further investigate which countries of the ASEAN-4 have competed with Vietnam in the global market; which product categories that Vietnam has competed with each country of the ASEAN-4, as well as the shifts of comparative advantages of some product categories from each country of the ASEAN-4 to Vietnam.

The evolution of a country's economic structure reflected by shifts in comparative advantages - from natural resource-based to low-technology intensive industries, then to medium-low technology, medium-high technology and finally to more sophisticated high-technology intensive ones - is a mandatory path for any developing countries moving towards developed ones. There are no exceptions for the ASEAN-5, and we have so far observed such progress occurring between them.

To sustain high economic growth, besides concentrating on the industries in which Vietnam has comparative advantages, Vietnam needs to wholly or partly restructure its economic system by focusing on industries whose world trade demand is growing relatively fast. These normally are the high value-added product categories of high-

technology intensive industries. Unfortunately, the contribution of Vietnam's high-technology exports was insignificant at 2.5 per cent only in the top-twenty exports.

Although restructuring is not free of costs, the potential gains certainly far outweigh such costs in the long run. With future prospect of becoming a full member of the ASEAN Free Trade Area, Vietnam will have to remove all its tariffs and non-tariff barriers in 2015, and with the recent accession into the World Trade Organisation in January 2007, it is essential for Vietnam to restructure its economic system in order to compete effectively in the Asian region as well as globally.

As the export-led growth hypothesis is supported in the case of Vietnam, therefore one way to trace out the sources of Vietnam's economic growth is to determine its sources of exports growth. The answer to this question will also help to further clarify the issue of whether the ASEAN-5's gains of comparative advantage have been in the rapidly growing or declining industries of world trade.

As mentioned above, the next Chapter Five will apply the constant market share model to investigate the ASEAN-5's sources of exports growth.

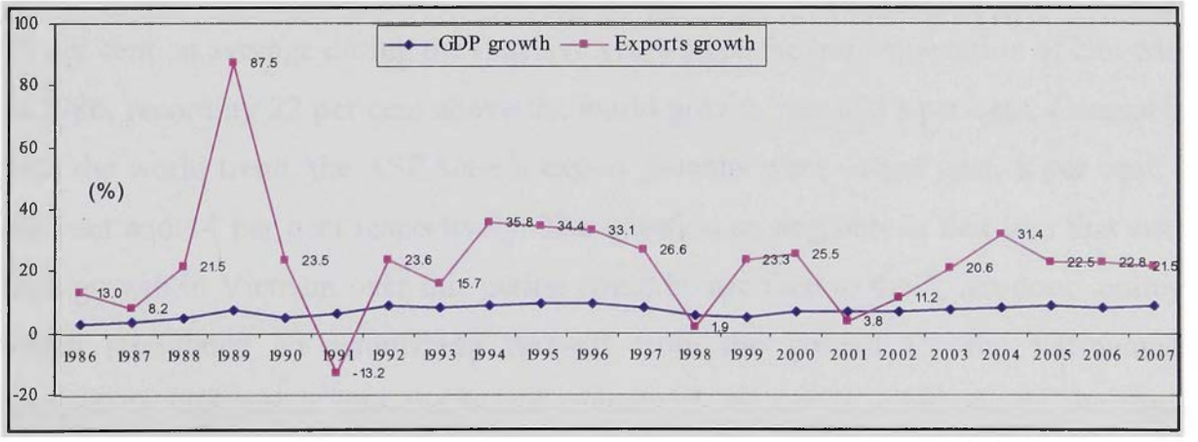
Chapter Five

ASEAN-5's SOURCES OF EXPORTS GROWTH

5.1 Introduction

Among the ASEAN-5, Vietnam experienced the highest exports growth during the period 1986-2006 with an average annual growth rate of 22 per cent compared with 9 per cent for the world and 10 per cent, 13 per cent, 12 per cent and 14 per cent respectively for the countries of the ASEAN-4. The five years prior to 1986, from 1981 to 1985, was the period of a world economic recession where the world export growth became negative in 1981, 1982, 1983 and 1985, recorded at –1.2, –6.3, –2.0 and –0.1 per cent respectively. Over this period, Vietnam's export growth was still stronger than that of the ASEAN-4 with an average annual growth rate of 16 per cent compared with –3 per cent for Indonesia, 4 per cent for Malaysia, –4 per cent for the Philippines, 2 per cent for Thailand and –1 per cent for the world.

Figure 5.1: Vietnam's GDP Growth and Exports Growth, 1986-2007 (%)



Source: World Development Indicators database.

With respect to GDP growth during 1986-2006, Vietnam also reported the highest average growth rate of 7.0 per cent annually, followed by Malaysia with 6.4 per cent

and 6.1 per cent for Thailand and then Indonesia and the Philippines with 5.2 per cent and 3.9 per cent respectively.

Table 5.1: ASEAN-5's GDP Growth and Exports Growth, 1986-2006 (%)

	Indonesia		Malaysia		Philippines		Thailand		Vietnam	
	GDP	Exports	GDP	Exports	GDP	Exports	GDP	Exports	GDP	Exports
1986-87	5.3	6.6	5.4	30.4	4.3	18.4	9.5	31.4	3.6	8.2
1988	6.4	13.6	9.9	17.7	6.8	24.5	13.3	36.9	5.1	21.5
1989	9.1	13.8	9.1	18.7	6.2	10.3	12.2	25.9	7.4	87.5
1990	9.0	15.9	9.0	17.6	3.0	4.7	11.2	14.9	5.1	23.5
1991	8.9	13.5	9.5	16.6	-0.6	8.4	8.6	23.2	6.0	-13.2
1992	7.2	16.6	8.9	18.7	0.3	10.8	8.1	14.2	8.6	23.6
1993	7.3	8.4	9.9	15.6	2.1	14.1	8.3	13.8	8.1	15.7
1994	7.5	8.8	9.2	24.9	4.4	19.5	9.0	22.4	8.8	35.8
1995	8.4	13.4	9.8	25.6	4.7	31.6	9.2	24.7	9.5	34.4
1996	7.6	9.7	10.0	6.0	5.8	16.6	5.9	-1.3	9.3	33.1
1997	4.7	13.0	7.3	0.5	5.2	21.9	-1.4	3.0	8.2	26.6
1998	-13.1	-10.5	-7.4	-6.9	-0.6	18.2	-10.5	-5.1	5.8	1.9
1999	0.8	1.7	6.1	15.2	3.4	24.3	4.4	7.3	4.8	23.3
2000	4.9	27.6	8.9	16.3	6.0	8.8	4.8	18.2	6.8	25.5
2001	3.6	-12.3	0.3	-10.4	1.8	-17.9	2.2	-5.9	6.9	3.8
2002	4.5	3.1	4.1	6.9	4.4	7.8	5.3	4.8	7.1	11.2
2003	4.8	8.4	5.7	11.3	4.9	2.9	7.1	17.9	7.3	20.6
2004	5.0	10.4	6.8	20.8	6.4	9.5	6.3	19.8	7.8	31.4
2005	5.7	22.9	5.0	11.4	4.9	4.0	4.5	14.5	8.4	22.5
2006	5.5	19.0	5.9	14.0	5.4	14.0	5.0	18.7	8.2	22.1
1986-2006 (average)	5.2	10	6.4	13	3.9	12	6.1	14	7.0	22

Source: Asian Development Bank, Key Indicators 2007.

It is noted from the following Table 5.2 that Vietnam's export growth jumped up to 35 per cent on average during the first five years since the implementation of Doi-Moi in 1986, recording 22 per cent above the world growth rate of 13 per cent. Compared with the world trend, the ASEAN-4's export growths were –1 per cent, 8 per cent, 2 per cent and 14 per cent respectively. The question arising here is that true that such high growth in Vietnam over this period could be ascribed to the 'open-door' policy, which stimulated an astonishing take-off from the ground for the Vietnamese economy's integration into the world economy?, or say in other words, its rapid growth may simply reflect the low base from which export growth in these industries had started, or else?

The only year that Vietnam's export growth was negative and slower than the ASEAN-4 countries was in 1991 with –13 per cent. The main reason for this during

the whole 25-year period was due to the privatisation (equitisation) process of manufacturing state-owned enterprises (SOEs) and the government relaxation on the SOEs subsidy policy as mentioned in Chapter Four, which ousted many non-profit-making SOEs from the industry and consequently affected the export sector (see Figure 5.1 above).[41]

Table 5.2: ASEAN-5 and World Merchandise Exports Growth for Selected Years (%)

	1981-1985	1986-1990	1991-1995	1996-2000	2001-2005	1986-2005	1998	2001	2003	2004	2005
World	-1	13	9	5	10	9	-2	-4	17	21	13
Indonesia	-3	12	12	8	6	10	-11	-12	8	13	20
(E.W.G.)	-2	-1	3	4	-4	1	-9	-8	-8	-9	6
Malaysia	4	21	20	6	8	14	-7	-10	11	21	11
(E.W.G.)	5	8	12	2	-2	5	-5	-6	-5	-1	-2
Philippines	-4	14	17	18	1	13	18	-18	1	7	4
(E.W.G.)	-3	2	8	13	-9	4	20	-14	-15	-14	-9
Thailand	2	27	20	4	10	15	-5	-6	18	20	14
(E.W.G.)	3	14	11	-1	0	6	-3	-2	1	-2	1
Vietnam	16	35	19	22	18	23	2	4	21	32	22
(E.W.G.)	17	22	11	17	7	14	4	8	4	10	9

Note: * E.W.G. = Exceeding world growth.

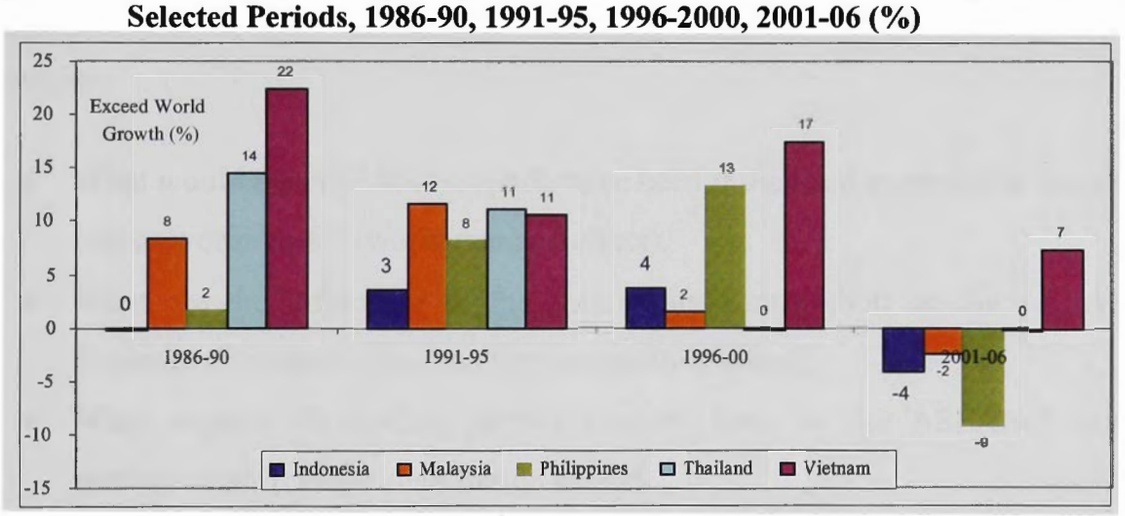
Over 1986-2006, there were two depressing events that affected the world economy, producing negative impact on the growth of world exports and the growth of GDP. These were the Asian financial crisis in 1998 and the world economic stagnancy, led by the US' dormant economy in 2001. The former event reported –2 per cent for world export growth, and a reduction of 2 per cent (from 4 per cent in 1997) for GDP growth; and the latter recorded –4 per cent for world export growth, and also a decrease of 2 per cent for GDP growth. According to Leung (2006: 7):

> The downturn in export growth in 1998 is probably attributable to an over-valued exchange rate and to the government's policy response of restricting imports (which dropped sharply in 1997, 1998 and 1999) as much as to the crisis in the region. The slowdown in 2001 and the downturn in 2002 are attributed mainly to falling prices of Vietnam's commodity exports (rice, coffee and petroleum) as well as the general slowdown in the world economy.

[41] Also, the collapse of Eastern European Communist bloc sent back to Vietnam many thousands of labour workers unemployed and natural disaster in middle of Vietnam contributing to the country's low output and export.

Among the ASEAN-5, Vietnam was the only nation that dodged the worse impact of these two incidences, because neither the ASEAN-4 nor the United States were Vietnam's key export partners in its foreign trade relations at that time; whereas the Philippines' economy had relied heavily on the United State's economy for many decades.[42] This explains why the Asian financial crisis in 1997-98 did not affect the Philippines' export high growth of 20 per cent above the world trend, while Vietnam recorded only 4 per cent, and the rest of the ASEAN-4 slumped below the negative world growth of –2 per cent, with –11 per cent for Indonesia, –7 per cent for Malaysia and –5 per cent for Thailand. Nevertheless, the slackness of the world economy, essentially motivated by the slowdown of the US' economy in 2001, had a worse impact on the Philippines' export growth with –18 per cent; while the growth was recorded at –12 per cent for Indonesia, –10 per cent for Malaysia and –6 per cent for Thailand in the same year.

Figure 5.2: ASEAN-5's Average Exports Growth Exceeded World Average Growth for Selected Periods, 1986-90, 1991-95, 1996-2000, 2001-06 (%)



Source: WTO statistics database.

The expansion of the world economy was witnessed extraordinarily strong growth of world exports during the three consecutive years of 2003, 2004 and 2005, with a growth rate recorded at 17 per cent, 21 per cent and 13 per cent respectively. Among the ASEAN-5, Vietnam was also the only nation that achieved an export growth exceeding the world trend by 4, 10 and 9 percentage points respectively in the same period. One significant factor to consider for this remarkable success of Vietnam's

[42] This will be illustrated further in Table 5.5 and Figure 5.5.

foreign trade in these years is the USV-BTA, which became effective in December 2001[43] and the lift of the US embargo towards Vietnam earlier.

While the world economy has recovered its strength, with relatively high export growth rates from 1996, after a sudden slump in world trade activities in 2001; the ASEAN-4 has had some drawbacks in the export sector with the rate of growth below the world trend. Specifically, compared to the world trend in 2003, 2004 and 2005, Indonesia's growth rate was reported –8 per cent, –9 per cent and 6 per cent respectively; Malaysia recorded –5 per cent, –1 per cent and –2 per cent respectively; the Philippines worsened with –15 per cent, –14 per cent and –9 per cent respectively; and Thailand almost grew the same rate with world trend, recorded at 1 per cent, –2 per cent and 1 per cent respectively in the same period (see Figure 5.2).

The question hence arisen here is that what factors have caused such downside effects for the ASEAN-4, and what factors have contributed to the success of Vietnam's export sector over the same period? This chapter will investigate the following questions:

- What would the ASEAN-5 exports have been if they had expanded at the same rate as world trade? (world demand effect).
- What are the influences of the commodity composition on the ASEAN-5 export performance? (commodity composition effect).
- What impacts do trading partner markets have on the ASEAN-5 export performance? (market distribution effect).
- What portion of the ASEAN-5 export growth is not related to any of those three factors above? (competitiveness effect).

It is worth to note that the empirical test results in Chapter Four also show that Vietnam was not able to acquire comparative advantage in the world rapidly growing

[43] The USV-BTA was signed by the two governments on July 13, 2000. It was passed by the U.S Congress on October 3, 2001 and signed by the U.S President on October 16, 2001. It was ratified by Vietnam's National Assembly on November 28, 2001 and signed by the President of Vietnam on December 7, 2001. The BTA came into force on December 10, 2001. Until the signing of the BTA on 13 July 2000, Vietnam was one of the few countries in which the US had imposed general tariffs that were generally much higher than the Normal Trading Status tariffs, which have been cut down from an average of 40 per cent to less than 3 per cent (Vietnam Ministry of Planning and Investment, 2005).

industries. Therefore, the answers to those questions, especially the commodity composition and market distribution effect, will also further clarify these results.

Specifically, the remainder of this chapter is organised as follows. Section 5.2 discusses the methodology, qualifications and results of the constant market share model, which is complemented by market shifting analysis of export partner regions that Vietnam and the ASEAN-4 have the trading relations. While Section 5.3 specifically examines the constant market share model applied to Vietnam in a 'defined' world,[44] Section 5.4 presents the global competitiveness index to support the findings in previous sections; and lastly Section 5.5 provides summary and concluding remarks on the chapter.

[44] The 'defined' world here is Vietnam's eleven top major trading partners. They are: (a) in Asia: China People's Republic of, China Hong Kong, Japan, Singapore and Republic of Korea; (b) in Europe: France, Germany, the Netherlands and United Kingdom; (c) in North and Central America: the United States; and (d) in Oceania: Australia.

5.2 Constant Market Share Model

5.2.1 Methodology and Qualifications

Constant market share analysis is an accounting method allowing one to evaluate why the exports growth of a country is faster (or slower) than world exports growth by decomposing a country's aggregated export growth into structural change effects and competitiveness effect. A country's export competitiveness is affected by various factors, including both price and non-price factors.

The method of constant market share (also known as 'shift-and-share') analysis became very popular in applied international economics with the original work of Tyszynski (1951). Since then, it has been used worldwide in empirical studies by many economists to discover the sources of a country's export growth over time. According to this method, the proportionate increase in a country's exports between the two time periods consists of various effects, namely: (1) the world demand effect, (2) the commodity composition effect, (3) the market distribution effect, and (4) a residual called the 'competitiveness' effect. In other words, as stated by Ariff and Hill (1985: 43):

> The increase in exports is attributed to the following factors: (a) the general growth of world exports to the focus destination, (b) the commodity mix of exports and differential growth in import demand, (c) the extent to which the particular markets represent growing centres of demand, and (d) an item which captures the net gain or loss in the market shares, owing, it is assumed, to changes in the relative price of the focus exporter's product.

The convenience of this method is effectively synthesised by Magee (1975: 221): 'The technique reveals that, even if a country maintains its share of every product in every market, it can still have a decrease in its aggregate market share if it exports to markets that grow more slowly than the world average and/or if it exports products for which demand is growing more slowly than average'.

However, the most important remarks were made by Baldwin (1958) and Richardson (1971a, 1971b), who consider constant market share analysis as an index number approach in which different weights of aggregation can be selected to obtain

consistency in accounting for changes in total exports. Richardson (1971a, 1971b) also notes that the values and sign of the various components may change if the final year of the period studied is considered as base year instead of the initial. Moreover, according to Milana (1988: 454):

> In the discrete-time formulation of constant market share, a further element apparently given by the interaction between commodity composition and market distribution effects arises if the same base year is used for the weights of the various components. This 'interaction' element was noted by Baldwin (1958) and Spiegelglas (1959) and was further discussed by Richardson (1971a, 1971b). There was not, however, a consensus on the interpretation of this residual element: some authors considered it a genuine economic variable (or 'a second measure of competitiveness', Richardson, 1971a: 236), while others found it of no economic meaning (see, for example, Reymert and Schultz, 1985).

Bowen and Pelzman (1984) also point out that the application of the constant market share procedure raises a number of questions concerning both measurement and aggregation. For example, what is the appropriate definition of the world market and regional markets in which a country competes? What is the appropriate level of commodity aggregation? Also, given a paucity of quantity data, value data are commonly used and thus price changes may hamper interpretation of the constant market share estimates. Furthermore, Richardson (1971a: 231) notes, a positive commodity composition effect, normally taken to imply that a country's exports were concentrated in goods for which demand was growing rapidly, may instead be due to a country's exports being concentrated in goods whose relative price is rising.

Nevertheless, Bowen and Pelzman (1984) also note that, in the absence of analysing price and non-price determinants of competitiveness, one could analyse changes in a country's export shares as *ex post* reflections of changes in competitiveness. Although changes in export shares are not entirely determined by changes in competitiveness, they nonetheless provide an accepted measure of changes in a country's competitiveness *vis-a-vis* the world market.

A change in a country's market share or export growth, due to structural changes in world trade, is seen as a difference between the hypothetical market share and the

initial share. The constant market share model decomposes the actual growth of a country's exports into four components as stated above, and its identity for a change in total exports of the ASEAN-5 can formally be written as:

$$X^{\circ\circ} - X^{\circ} = rX^{\circ} + \sum_i (r_i - r)X_i{}^{\circ} + \sum_i \sum_j (r_{ij} - r_i)X^{\circ}{}_{ij} + \sum_i \sum_j (X_{ij}{}^{\circ\circ} - X_{ij}{}^{\circ} - r_{ij}X^{\circ}{}_{ij}) \quad [5.1]$$

(1) *(2)* *(3)* *(4)*

where: *(1)* = world trade (demand) effect

(2) = commodity composition effect

(3) = market distribution effect

(4) = competitiveness effect

X = ASEAN-5's total exports

X_{ij} = ASEAN-5's exports of commodity i to market j

X_i = ASEAN-5's total exports of commodity i

r = growth rate of total world exports

r_i = growth rate of total world exports of commodity i

r_{ij} = growth rate of world exports of commodity i to market j

^{0} = initial period

^{00} = second period.

Equation [5.1] represents the three-level analysis in which the growth of the ASEAN-5's exports is broken into four terms. The first term *(1)* is the general rise of the ASEAN-5's exports if they had grown at the same rate as the world export trend. The second term *(2)* is the commodity composition effect that measures the change in the ASEAN-5's exports arising from the different rates of world growth for individual commodities relative to the growth rate of world total exports, given the distribution of the ASEAN-5's exports by commodity. It is calculated by summing up the world growth rate in apparent consumption in each commodity group sector, compared to the growth rate of total world exports, weighted by the share of exports going to each sector in the initial period. The third term *(3)* is the market distribution effect, which measures whether the ASEAN-5's exports were concentrated in markets where demand was growing either faster or slower than the world export trend in those markets. The fourth term *(4)* is the residual competitiveness effect, which indicates

the differences between the actual export change, and the hypothetical change if the ASEAN-5 had maintained their export shares in each market with respect to each commodity group. An increase in competitiveness is showed by a positive value of the residual, and vice versa.

As the first part of this section focuses on the ASEAN-5's merchandise exports to the world market as a 'whole', there is no particular market involved but the whole world market and hence no market distribution effect included; the third term *(3)* in the equation above, therefore, is not applicable to this case. Equation [5.1] becomes:

$$X^{\circ\circ} - X^{\circ} = rX^{\circ} + \sum_i (r_i - r)X_i{}^{\circ} + \sum_j (X_i{}^{\circ\circ} - X_i{}^{\circ} - r_i X^{\circ}{}_i) \qquad [5.2]$$

(1) *(2)* *(3)*

However, in the latter part, the equation [5.1] will be applied when the whole world is divided into 'sub-worlds' to further analyse and seize more detailed factors on the four effects of the constant market share model.

The first term *(1)* will register as positive if the world market in which the ASEAN-5 exports are relatively concentrated tended to grow relatively faster than the previous year (period). The second term *(2)* will register as positive if the products, in which the ASEAN-5 are relatively specialised, experienced with a higher growth rate than the growth of world demand. This positive will receive a heavy weight when added to other term X_i^o. The third term *(3)* will record as positive if there is an increase in competitiveness of the ASEAN-5.

5.2.2 Results and Analysis

According to Chow and Kellman (1993: 24), both the world trade demand effect *(1)* and the commodity composition effect *(2)* may be considered as 'external' demand factors; since fluctuations in world economies and markets, from one year to the next, tend to occur considerably more rapidly than annual changes in the ASEAN-5's export markets or product composition, and were not under the control of the ASEAN-5; the world demand effect and the commodity composition effect, thus, are clearly 'external' (demand-oriented) factors from the viewpoint of the ASEAN-5.

Conversely, the competitiveness effect *(3)* may be viewed as an 'internal' (supply-oriented) factor, since it is independent of changes in overall world demand patterns.

The question then should be raised now, whether the external demand-oriented, world demand and commodity effects and internal competitiveness effect tended to have a significantly different or similar pattern in the ASEAN-5's exports over 1997-2006? Table 5.3 indicates those years in which each of these three effects showing negative effects on each of the ASEAN-5's exports growth.

It is obvious that all the ASEAN-5 had a similar pattern in the world demand effect, which appears to be the main factor contributing to their export growth due to a general rise in world trade demand, except with the Asian financial crisis in 1997-98 and the world economic stagnancy in 2001, where all the ASEAN-5's world demand effects were negative. However, Vietnam's competitiveness effect pattern was totally different from that of the ASEAN-4, showing a positive effect over the whole period. This appears that competitiveness effect was really a key factor driving the growth of Vietnam's exports over this period.

Table 5.3: Years in Which the Three Effects Impacted on ASEAN-5's Export Growth

	Indonesia			Malaysia			Philippines			Thailand			Vietnam		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
1997-98	x	x	x	x		x	x			x	x	x	x	x	
1999			x					x			x				
2000					x			x	x		x				
2001	x	x	x	x	x	x	x	x	x	x		x	x		
2002		x	x									x		x	
2003			x		x	x		x	x		x				
2004			x			x		x	x		x	x		x	
2005						x		x	x		x				
2006						x		x			x			x	

Notes: (1) world demand effect; (2) commodity effect; (3) competitiveness effect. While x indicates a negative effect, no sign denotes a positive effect.
Source: This table is extracted from Table 5.4 below.

It is noted that the sum of each country's world demand effect, commodity effect and competitiveness effect equals to either 100 or –100 (see Table 5.4) depending on whether the overall effect rises or falls. For instance, even though affected by negative world demand and commodity composition effects in a number of years, Vietnam's competitiveness effect was so strong that the overall market share for the whole

period turned to positive. Observing Table 5.4 and Figure 5.3, one will notice that in 1998, while the world demand and commodity effects were –37 per cent and –203 per cent respectively, the competitiveness effect increased by a remarkable amount of 340 per cent. In other words, the growth value of US$176 million of Vietnam's merchandise exports in this year was explained by an increase of US$598 million due to the competitiveness factor, while the world demand effect reduced by US$–65 million and the commodity effect declined by US$–357 million. Also in 2001, an increase of US$580 million in Vietnam's exports can be explained by a –103 per cent decline in the world demand effect, an increase of 26 per cent in the commodity effect and a boost of 177 per cent in the competitiveness effect. These results are consistent with earlier discussions that Vietnam escaped the two negative events in 1997-98 and 2001, whereas Malaysia and Thailand had the overall effect of –100 per cent in those two years, and Indonesia was badly affected by the Asian financial crisis with another –100 per cent overall effect in 1999. Meanwhile, the Philippines had this negative overall effect in 2001 only.

Table 5.4: ASEAN-5's Constant Market Share Analysis, 1997-2006 (%)

		1997-1998	1999	2000	2001	2002	2003	2004	2005	2006
World demand effect	IND	-8	1077	48	-42	326	248	375	41	79
	MAL	-10	26	82	-37	71	149	101	112	103
	PHI	-4	21	153	-25	51	581	220	344	93
	THL	-9	44	75	-73	113	93	106	93	75
	VN	-37	17	52	-103	44	82	67	59	61
Commodity composition effect	IND	-57	411	25	-6	-46	26	36	7	5
	MAL	10	0	-5	-10	5	-3	0	0	0
	PHI	11	-1	-30	-5	0	-69	-12	-105	-4
	THL	-1	-17	-18	16	1	-5	-5	-13	-2
	VN	-203	4	15	26	-14	3	-4	17	-5
Competitiveness effect	IND	-35	-1588	27	-52	-179	-173	-310	52	16
	MAL	-100	74	23	-53	24	-46	-1	-12	-3
	PHI	93	80	-23	-70	49	-412	-108	-139	11
	THL	-90	73	43	-43	-14	12	-1	20	27
	VN	340	79	33	177	70	15	37	24	44

Note: The sum of each country's world demand effect, commodity effect and competitiveness effect equals to ±100.

Source: Author's calculation based on UN Comtrade database.

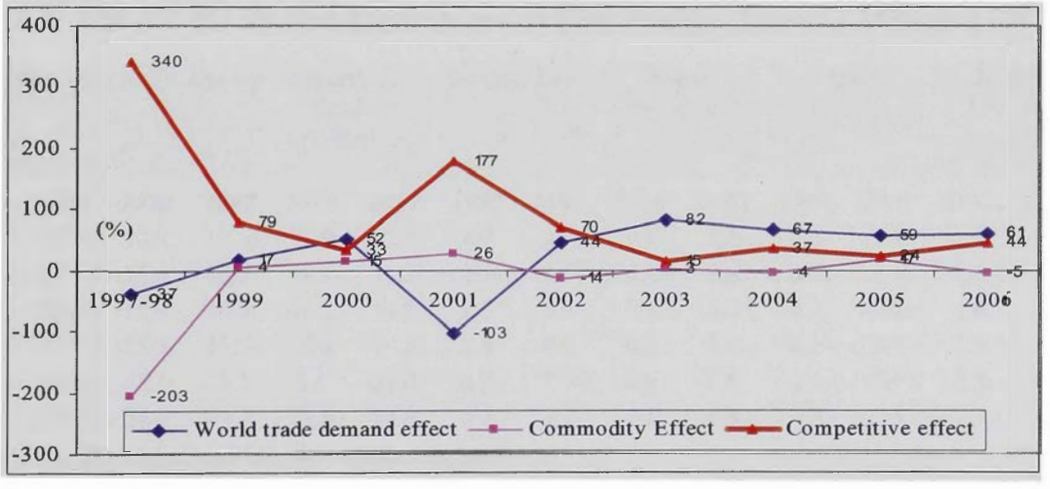
Therefore, it seems that the two external demand-oriented effects, depending on the world market demand for some particular products, tended to have the same effect on

each of the ASEAN-5 in a fairly analogous manner. On the other hand, the internal factor, supply-oriented competitiveness effect varied largely between Vietnam and the ASEAN-4. In other words, the characteristics of Vietnam's export structure have been different to the second tier NICs as confirmed in Chapter Four.

Generally speaking, the major source of export growth for all the ASEAN-4 was the world demand effect, while the commodity composition and competitiveness effects retarded their growth over the period studied. As for Vietnam, while the commodity effect had a negative impact on its growth, the sources of export growth contributed by the general rise of the world demand effect, particularly from 2002, and boosted further by the competitiveness effect although declining also from 2002.

Another question then would be brought up here is why Vietnam competed so well, in terms of competitiveness, compared to the ASEAN-4 over this period? A detailed analysis of the constant market share applied to Vietnam in a 'defined' world will be investigated further in the next section of this chapter. In the meantime, the following sub-section will discuss this issue from a non-constant market share viewpoint.

Figure 5.3: Vietnam Constant Market Share Analysis to the World, 1997-2006 (%)



Source: Author's calculation based on UN Comtrade database.

5.2.3 Shifting the Markets: Another Look at the Constant Market Share Analysis

In order to seize more interesting details to complement the constant market share model, and to produce a relatively precise evaluation on results drawn from applying this technique; this section examines the world import markets in which the ASEAN-5 has had trading relations since 1990. The 'whole' world market now has been divided into four 'sub-worlds' (or main regions) in which there are some countries representing the ASEAN-5's major trading partners:

- Asia (China People's Republic of, China Hong Kong, Japan, Singapore and Korea, Republic of)
- Europe (France, Germany, the Netherlands and United Kingdom)
- North and Central America (the United States), and
- Oceania (Australia)

These eleven countries, defined as the 'new world',[45] have been the ASEAN-5's top trading partners for several decades. The total shares of the ASEAN-5's merchandise exports to this 'world' have accounted for more than 90 per cent of their total exports.

Table 5.5: ASEAN-5's Market Distribution of Merchandise Exports, 1990 and 2007(%)

	Asia		Europe		North & Central America		Middle East		South America		Africa		Oceania		Rest of the World	
	1990	*2007*	*1990*	*2007*	*1990*	*2007*	*1990*	*2007*	*1990*	*2007*	*1990*	*2007*	*1990*	*2007*	*1990*	*2007*
Indonesia	64.5	60.8	12.9	13.3	13.9	12.5	2.9	2.7	0.1	1.1	0.5	1.5	1.9	3.9	3.5	4.2
Malaysia	58.0	57.1	16.6	13.5	18.1	17.3	2.5	3.5	0.3	0.6	0.4	1.4	2.0	3.9	2.2	2.8
Philippines	34.8	68.5	18.9	10.5	40.2	14.8	1.6	0.8	0.1	0.3	0.2	0.2	1.6	1.3	2.6	3.6
Thailand	37.9	54.1	25.3	15.5	25.4	14.5	5.4	4.9	0.2	1.6	2.1	2.5	1.9	4.3	2.1	2.5
Vietnam	39.1	36.8	48.1	23.1	0.6	25.0	0.9	1.6	0.0	0.6	0.2	1.1	0.3	7.7	10.7	4.1
ASEAN-5	*46.9*	*55.5*	*24.4*	*15.2*	*19.6*	*16.8*	*2.7*	*2.7*	*0.1*	*0.8*	*0.7*	*1.3*	*1.5*	*4.2*	*4.2*	*3.4*

Source: Asian Development Bank, Key Indicators 2008.

While Table 5.5 presents the ASEAN-5's market distribution of merchandise exports for 1990 and 2007, figures 5.4 to 5.8 show the ASEAN-5's direction of trade and their

[45] Where the region consists of one nation only, then this nation name will be used; for example, the United States representing North and Central America; Australia indicating of Oceania. Where the region contains several countries, then the region name will be mentioned in this section.

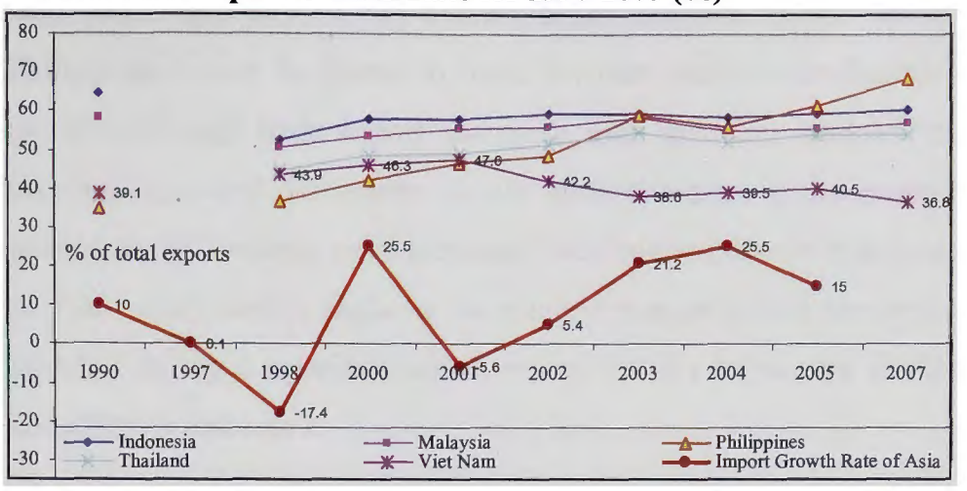
respective import growth rate of the abovementioned markets (regions),[46] in which the ASEAN-5 has trading relations for the 1998-2007 period. Over this decade, it appears that Asia has become the major trading centre for the ASEAN-5 in accordance with the aims and purposes of the Association of Southeast Asian Nations, in which all the ASEAN-5 are active members. One of the Association's objectives is 'to accelerate the economic growth, social progress and cultural development in the region'. The Framework Agreement on Enhancing Economic Cooperation was adopted at the fourth ASEAN Summit in Singapore in 1992, which included the launching of a scheme toward an ASEAN Free Trade Area (AFTA). The strategic objective of AFTA is to increase the ASEAN region's competitive advantage as a single production unit. Indeed, the Overview of this Association states: 'ASEAN cooperation has resulted in greater regional integration. Within three years from the launching of AFTA, exports among ASEAN countries grew from US$43.26 billion in 1993 to almost US$80 billion in 1996, an average yearly growth rate of 28.3 per cent. In the process, the share of intra-regional trade from ASEAN's total trade rose from 20 per cent to almost 25 per cent' (Association of Southeast Asian Nations, n. d.).

As a bloc, the ASEAN-5's average export shares to Asia constituted 47 per cent of its total merchandise exports in 1998; this distribution to the surrounding markets in the region has increased to 55.5 per cent in 2007, which means an increase of 8.5 percentage points over this period. How can this remarkable performance be explained in terms of market distribution?

From Figure 5.4 below, it is obvious that Indonesia, Malaysia and Thailand were largely more dependent on Asian markets than were Vietnam and the Philippines. In 1998, the export distribution for each of these three countries to Asia accounted for around 50 per cent of its total merchandise exports. Specifically, the share was 52.8 per cent for Indonesia, 50.8 per cent for Malaysia and 45 per cent for Thailand. This explained why these countries had been affected badly by the Asian financial crisis.

[46] The import growth rates of these regions are calculated by adding the total merchandise imports of all countries in the group by each year, then work out the annual percentage change.

Figure 5.4: Distribution of ASEAN-5's Merchandise Exports to Asia for 1998-2007 and Asia's Import Growth Rate for 1990-2005 (%)



Source: UN Comtrade database.

Apart from this downturn crisis, these countries would have been best positioned for their export shares which amounted to half of their total exports directed to the relatively fast growing Asian import markets, and this growing trend would continue for many unforeseen years ahead as stated by the United Nations' former Secretary-General, Mr. Kofi Anan (2000): 'Today, ASEAN is not only a well-functioning, indispensable reality in the region. It is a real force to be reckoned with far beyond the region. It is also a trusted partner of the United Nations in the field of development'.[47]

As for the Philippines, instead of heavily relying on the US markets alone, the Philippines' strategy of shifting (or diversifying) its export markets (after the world economic slowdown in 2001), by focusing on its neighbouring Asian countries, seems to be a smart move in the long run. Figure 5.4 is evidence for this move, showing an increase in market distribution by 31.4 percentage points between 1998-2007 for Asian markets (from 37.1 to 68.5 per cent) and a 23.8 percentage points decrease for the US markets, from 38.6 down to 14.8 per cent (see Figure 5.5).

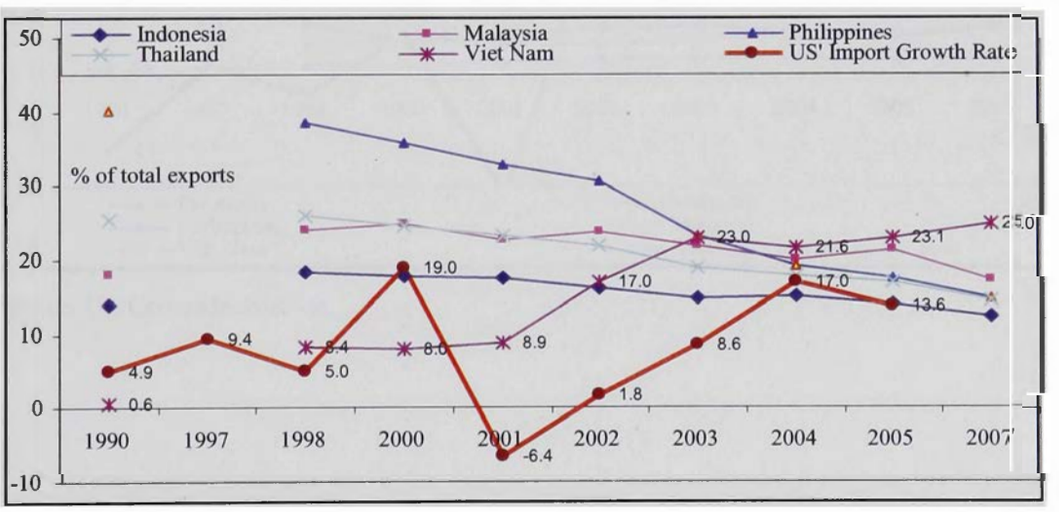
Between 2001-07, the Philippines has shifted its export shares from the US to Asian markets while Vietnam did the contrary, moving towards the US market with an increase of export shares by 16 percentage points (from 9 to 25 per cent) after the USV-BTA taking effect in December 2001. At the same time, Vietnam's export shares dropped 10.8 percentage points in Asian markets, from 47.6 to 36.8 per cent.

[47] Stated on 16/2/2000, viewed in September 2006 at: http://www.aseansec.org/64.htm.

Diversifying export markets, especially to faster growing ones, is a clever and indispensable planning policy for any country in the long run. In this sense, Vietnam and the Philippines would be found to have the best market distribution effect by shifting (or diversifying) their export shares to high growing markets in order to expand their trading world. Of course, so are other countries in the group since all, with the exception of Vietnam, have increased their market distribution towards Asia from 1998. This policy clearly explains the positive market (world demand) effect for all the ASEAN-5 during the period studied, except for two depressing world events in 1997-98 and 2001 as discussed.

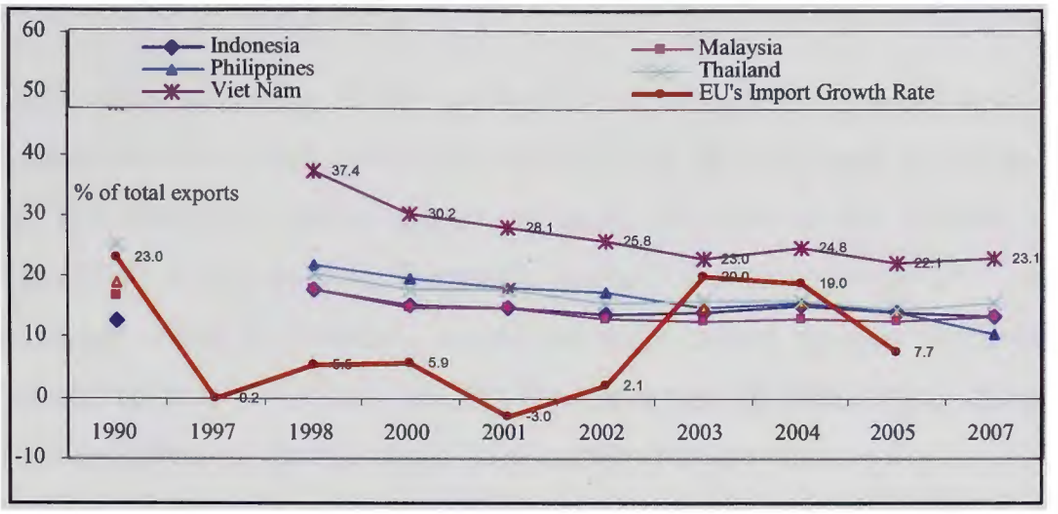
It is noted that, the share of Vietnam's merchandise exports to Europe declined by 14.3 percentage points, from 37.4 down to 23.1 per cent over 1998-2007 (see Figure 5.6). Also, by observing Figure 5.5, one will easily see a positive correlation between the share growth of Vietnam's exports to the US and the import growth rate of the US from 2001.

Figure 5.5: Distribution of ASEAN-5's Merchandise Exports to the U.S for 1998-2007 and the US Import Growth Rate for 1990-2005 (%)



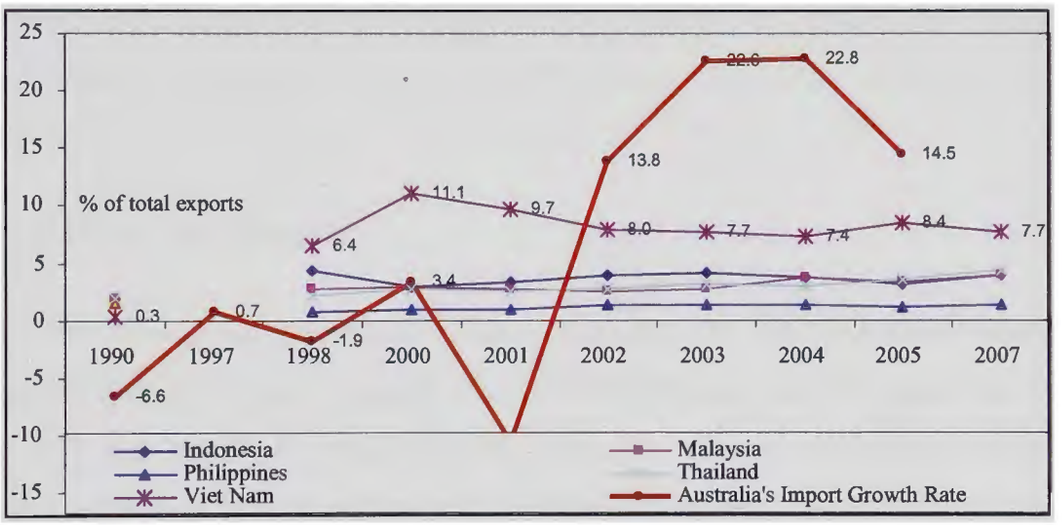
Source: UN Comtrade database.

Figure 5.6: Distribution of ASEAN-5's Merchandise Exports to Europe for 1998-2007 and the European Import Growth Rate for 1990-2005 (%)



Source: UN Comtrade database.

Figure 5.7: Distribution of ASEAN-5's Merchandise Exports to Australia for 1998-2007 and the Australian Import Growth Rate for 1990-2005 (%)



Source: UN Comtrade database.

5.3 Constant Market Share Model Applied to Vietnam in a 'Defined' World for 1997-2006

One method for assessing of the sources of export growth in more detail is to decompose the world into sub-worlds (or regions) as mentioned in the previous section. The following section applies the same procedure of the constant market share model to further analyse Vietnam's sources of export growth in a 'defined' world market, which is Vietnam's eleven top major trading partners as discussed.[48] This 'world' then will be divided into regions for separately achieving more accurate and profound effects in the success of Vietnam's export growth.

Equation [5.1] is thus applied in this section:

$$X^{\circ\circ} - X^{\circ} = rX^{\circ} + \sum_i (r_i - r)X_i{}^{\circ} + \sum_i \sum_j (r_{ij} - r_i)X^{\circ}{}_{ij} + \sum_i \sum_j (X_{ij}{}^{\circ\circ} - X_{ij}{}^{\circ} - r_{ij}X^{\circ}{}_{ij}) \quad [5.1]$$

The results of this constant market share (CMS) model for Vietnam in trading with Asia, Australia, Europe, USA and the 'world' are presented in the following tables 5.6 to 5.10.

5.3.1 CMS to the 'World'

As for this 'world' of eleven top trading partners, the key factor accounting for success in Vietnam's export growth over 1997-2006 was, with the exception of two years 1998 and 2001, the general rise of the world demand effect, particularly from 2002 thanks to the USV-BTA increasing Vietnam's exports flow into the US markets, and an unexplained residual competitiveness effect as discussed earlier.

In contrast to the world demand and competitiveness effects, the commodity composition and market distribution effects each had a negative impact on Vietnam's exports, particularly the latter showing negative values over time. This implies that Vietnam's exports were concentrated in markets where demand was growing slower than the world export trend. Meanwhile, the commodity composition effect was insignificant and fluctuated around the horizontal axis. This finding signifies that Vietnam's exports have been specialised and concentrated in commodities for which

[48] In Asia: China People's Republic of, China Hong Kong, Japan, Singapore, and Republic of Korea; in Europe: France, Germany, the Netherlands and United Kingdom, and the United States and Australia in North and Central America and Oceania areas respectively.

the world demand was growing slowly over this period. This raises a concern for Vietnam's exports as discussed previously in Chapter Four.

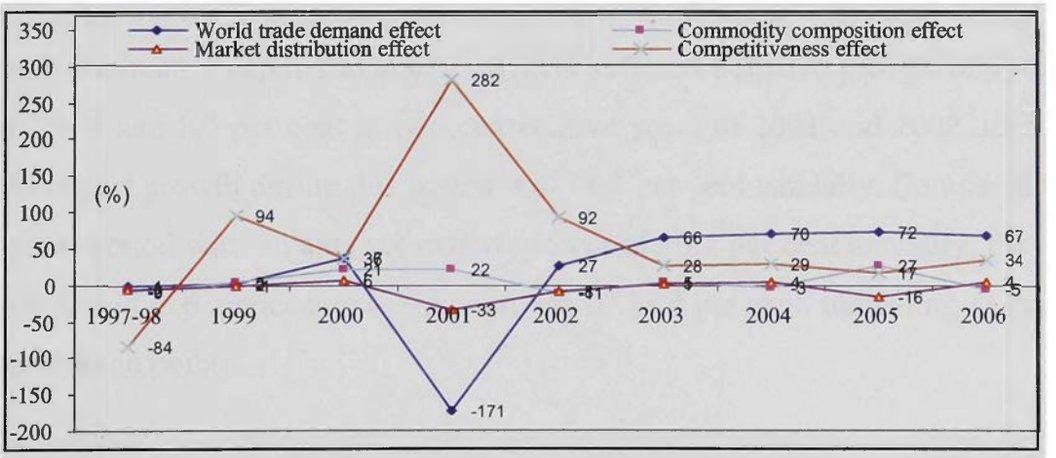
Table 5.6: Vietnam's CMS Analysis to 'World' Market, 1997-2006 (%)

	1997-98	1999	2000	2001	2002	2003	2004	2005	2006
World demand effect	-1	2	36	-171	27	66	70	72	67
Commodity effect	-9	5	21	22	-11	5	-3	27	-5
Market distribution effect	-6	-1	6	-33	-8	1	4	-16	4
Competitiveness effect	-84	94	37	282	92	28	29	17	34
Total	-100	100	100	100	100	100	100	100	100

Source: Author's calculation based on UN Comtrade database.

It is noticeable that, while the Asian financial crisis had worse impact on Vietnam's competitiveness effect (–84 per cent), the world economic slackness in 2001 had more negative impact on its world demand effect (–171 per cent).[49] More specifically, negative growths of the former were recorded in all the commodity groups from SITC 0-8, except SITC 9;[50] whereas negative growths of the latter reported in three commodity groups namely: SITC 3 (fuels, lubricants, etc.) with a decline of US$–272.4 million, SITC 4 (animal vegetable oils, fats, wax) with US$–17 million, and SITC 9 (goods not classified by kind) with US$–229 million; but the other seven sections of the SITC Revision 3 all registered positive growth.

Figure 5.8: Vietnam's Constant Market Share to the 'World', 1997-2006 (%)



Source: UN Comtrade database.

[49] Over the period studied, the average growth rates of Vietnam's exports to Asia, Europe and the US were 11.7 per cent, 15.4 per cent and 44.4 per cent respectively.

[50] According to SITC (Rev. 3) these groups are: (0) = food and live animals; (1) beverages and tobacco; (2) = crude materials excluding fuels; (3) = mineral fuels, lubricants, etc.; (4) Animal, vegetable oil and fats; (5) = chemicals, reltd. products, n.e.s; (6) = manufactured goods; (7) = machines, transport equipment; (8) = miscellaneous manufactured goods; and (9) = unclassified goods.

5.3.2 CMS to Asian Markets

In Asian markets, the results indicate that over the period studied, the major source of Vietnam's export growth was the general increase of world trade demand from 2002, while the factors retarding its growth were all other effects, particularly the competitiveness effect declined from 2002. The world demand effect had a strong negative impact in 2001 but became the key factor for the rapid growth of Vietnam's exports to Asia in the following years.

The Asian financial crisis hit Vietnam's exports hardest in 1998 with declined export growth for all the SITC groups (0-9), while the slowdown of world economy in 2001 had negative impacts on some commodity groups such as SITC 3 (fuels, lubricants etc.) with a decline of US$–193 million, SITC 4 (animal, vegetable oil and fats) with US–$17.7 million and SITC 9 (unclassified goods) with US$–127 million.

Table 5.7: Vietnam's CMS Analysis to Asian Markets, 1997-2006 (%)

	1997-98	1999	2000	2001	2002	2003	2004	2005	2006
World demand effect	-1	3	31	-696	927	102	63	74	159
Commodity effect	-10	6	19	54	-402	12	2	47	1
Market distribution effect	-24	-0	17	-499	-339	-2	11	-9	23
Competitiveness effect	-65	91	33	1241	-86	-12	24	-12	-83
Total	-100	100	100	100	100	100	100	100	100

Source: Author's calculation based on UN Comtrade database.

Although Vietnam's exports to Asian markets suffered negative growth of –60.7 per cent in 1998 and 0.5 per cent in two consecutive years of 2001 and 2002, its overall average export growth during this period was 11.7 per cent annually. Compared to the 1997-2000 period with an average export growth of 10.4 per cent annually, the recent 2000-06 period experienced an average growth of 12.4 per cent, indicating an increase of 2 percentage points.

With respect to nominal values, Vietnam's exports to these Asian countries increased from US$4,213 million in 1997 to US$6,677 million in 2003 and US$11,438 million in 2006.

5.3.3 CMS to European Markets

Similar to the 'World' market, while the world demand and competitiveness effects were key contribution factors to Vietnam's exports growth in Europe, especially from 1999; the factors retarding its growth were still the commodity composition and market distribution effects. The commodity composition effect had impeditive impacts over the whole period, since most of commodity groups that Vietnam specialised and exported to Europe were the low value-added products of natural resource and low-tech industries, which experienced a slow growing demand in Europe. These groups mainly were seafood, coffee, footwear and wooden products, and textiles and garments.[51]

Table 5.8: Vietnam's CMS Analysis to European Markets, 1997-2006 (%)

	1997-98	1999	2000	2001	2002	2003	2004	2005	2006
World demand effect	-1	2	112	-91	128	80	89	213	55
Commodity effect	-2	-1	-51	63	-10	-8	-15	-62	-11
Market distribution effect	7	0	-70	34	-25	13	0	-89	1
Competitiveness effect	-104	99	109	94	7	15	26	38	55
Total	-100	100	100	100	100	100	100	100	100

Source: Author's calculation based on UN Comtrade database.

Over this period, although affected by the world economic slackness in 2001 with declining export growth of 4.3 and 3.8 per cent in 2001 and 2002 respectively to the EU markets, Vietnam's average export growth recorded 15.4 per cent annually with values increased from US$1,182 million in 1997 to US$2,600 million in 2003 and US$4,281 million in 2006.[52] However, between 1997-2000 and 2000-06, the average

[51] According to Vietnam Ministry of Industry and Trade (MoIT, 2008), Vietnam's exports to the EU will reach US$10.4 billion in 2008, a year-on-year rise of 23.5 percent. In particular, footwear is expected to remain the country's major staple with export revenues estimated at US$2.7 billion. The EU is currently the world's second largest importer of Vietnam's footwear after the US. It bought US$2.1 billion worth of footwear from Vietnam in 2007, representing 7.2 percent of its total import value of the item. In recent years, the EU's footwear import reaches US$29 billion each year. Although textiles and garments are expected to bring home around US$1.65 billion, it will be considerably affected by the EU's removal of quota for China's textiles and garments this year (2008). The EU is also the biggest consumer of Vietnamese coffee, accounting for around half of the country's coffee export value. The nation's coffee export to the EU is forecast to fetch US$820 million this year, a slight reduction compared with 2007 due to the decrease in domestic production output. Meanwhile, seafood export to the EU is expected to reach US$1.15 billion, a year-on-year rise of 25 percent, and wooden products, around US$780 million, a year-on-year surge of 30 percent (Source: http://vnexporters.com). It is noted that the EU mentioned above from Vietnam MoIT encompasses all countries in the EU while the EU in this study consists of four main trading partners of Vietnam only.

[52] Source is UN Comtrade database.

growth rate of Vietnam's exports to the EU markets declined from 19 per cent in the former to 13.7 per cent in the latter period.

5.3.4 CMS to US Markets

Like the other markets, Vietnam's commodity composition and market distribution effects hindered its export growth in the US markets with most of the years experiencing negative values. Meanwhile, Vietnam's exports to these markets were mainly driven by the world demand effect (except for 1998 and 2001 showing –1 per cent and –8 per cent respectively) and the competitiveness effect.

Table 5.9: Vietnam's CMS Analysis to the US Market, 1997-2006 (%)

	1997-98	1999	2000	2001	2002	2003	2004	2005	2006
World demand effect	-1	52	29	-8	4	28	76	75	43
Commodity effect	-4	252	2	10	-1	-2	-15	-9	-9
Market distribution effect	13	-6	17	-4	-1	-10	-18	-6	-10
Competitiveness effect	92	-198	52	102	98	84	57	40	76
Total	100	100	100	100	100	100	100	100	100

Source: Author's calculation based on UN Comtrade database.

However, among the defined regions, Vietnam's exports to the US markets were strongest over the period studied (1997-2006) with an average export growth rate of 44 per cent each year; particularly an increase of 10 percentage points from 39 per cent over 1997-2001 to 49 per cent over the recent 2001-06 period. Obviously, this remarkable increase was thanks to the USV-BTA as mentioned earlier. Indeed, Vietnam's exports to the US increased from US$287 million in 1997 to US$2,453 million in 2002, then to US$7,850 million in 2006,[53] which means an increase of 27-fold over a decade (1997-2006). Also, data from the UN Comtrade database (mirror statistics) show that, between 2002 and 2006, Vietnam's clothing exports to the US alone increased threefold from US$980 million to US$3,430 million; footwear exports also increased more than fourfold from US$240 million to US$1,035 million; and furniture exports expanded more than eleven fold from US$95 million to US$1,101 million.[54] After the USV-BTA taking effect, Vietnam's largest export market has been the US, followed by Japan, China and Australia.

[53] Source is UN Comtrade database.

[54] According to Vietnam MoIT, Vietnam's exports to the US are expected to reach 13.1 billion USD in 2008, an increase of 28 percent over 2007. The ministry said Vietnam's revenue from exports to the US increased by 39 percent this year to 10.2 billion USD. Trade officials attributed 2007's growth rate to a

5.3.5 CMS to Australian Markets

In general, the competitiveness effect was a major factor for the growth of Vietnam's exports to Australian markets. Meanwhile, all other effects contributed fairly even over the period studied. This implies that the success of Vietnam's exports to this market was thanks to a general rise of world demand, a growing demand of Australians for Vietnam's exports and the demand of Australian markets growing faster than the general world demand over this period.

It is noted that a –20 per cent growth of commodity effect in 2002 was due to world export growth of SITC 3 (mineral fuels, lubricants etc.) of –1.8 per cent growing much slower than the growth of total world exports (4.9 per cent).

Also, it is noticeable that, in 1999, the competitiveness effect was the only source for Vietnam export growth in Australia, while other factors had neutral effects. The reason is Australia's world import growth for these ten commodity groups weighted by their respective values was far less than the change in Vietnam exports values of these commodity groups into Australian market in 1999.

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spike in the export value of high growth export items such as clothing, seafood, wood products and coffee. To reach its target of 13.1 billion USD in exports to the US in 2008, Vietnam will still depend on those products, as well as footwear. The garment sector currently takes up the lion's share of Vietnam's exports, with a value of 4.4 billion USD. Next year, Vietnam's garment exports to the US are likely to reach US$5.4 billion, a rise of 25.6 percent. The US is now Vietnam's biggest importer of garments, which account for 55 percent of Vietnam's total exports to US market. However, Vietnam's garment industry still faces challenges due to American policies monitoring Vietnamese garments until the end of 2008. MoIT and the Vietnam Association of Textile and Apparels have consistently opposed the inspection policy and proposed the US ease the monitoring of Vietnamese garments to help local garment enterprises develop steadily. Vietnam's footwear exports to the US hit the US$900 million mark in 2007, a 12 percent increase over 2006. The footwear industry set the target of US$1.1 billion exports for 2008, a 22 percent increase over 2007. If that goal is reached, Vietnam will account for more than 5 percent of total footwear imports by the US. Vietnam is also planning to boost its export of wood products to the US in the coming year as a result of cheap labour and high skill, industry insiders said. The lumber processing and wood products industries aim to export US$1.1 billion of their goods in 2008, a 23.6 percent upswing from this year. The seafood industry hopes to continue tapping the US market next year with a 14.9 percent increase over 2007, bringing its export total to US$850 million. In 2008, Vietnam's coffee industry anticipates shipping 125,000 tonnes of coffee to the US, with an export value of US$200 million, the same as 2007. The US is the world biggest coffee importer. New items such as shoulder bags, purses, suitcases, hats and umbrellas also promise another export windfall. Vietnam hopes to boost exports of these items to US$270 million in 2008, up 31 percent from 2007 (www.vnexporters.com).

Table 5.10: Vietnam's CMS Analysis to Australian Markets, 1997-2006 (%)

	1997-98	1999	2000	2001	2002	2003	2004	2005	2006
World trade effect	-1	0	24	-21	17	242	64	30	39
Commodity effect	-12	0.6	70	-25	-20	101	18	50	4
Market distribution effect	-9	0.4	-10	-20	5	67	41	-3	38
Competitiveness effect	-78	99	16	-34	98	-310	-23	23	19
Total	-100	100	100	-100	100	100	100	100	100

Source: Author's calculation based on UN Comtrade database.

Although Vietnam's merchandise exports into Australia declined with a growth rate of –78 per cent in 1998 and –18 per cent in 2001, the average growth rate was 36 per cent each year over the period studied. It is noted, however, that Vietnam's exports to Australia declined from 77 per cent to 19 per cent, a drop of 58 percentage points between 1997-2000 and 2000-06. In nominal values, Vietnam's exports increased from US$230 million in 1997 to US$1,272 million in 2000 and US$3,689 million in 2006,[55] which indicates an increase of sixteen-fold to Australian markets over this period. The majority of the increase largely came from a surge in the value of oil exports. Crude oil to Australia constituted 82 per cent of Vietnam's total merchandise exports in 2006. Other significant items were fish and crustaceans (A$151 million), furniture (A$79 million) and fruit and nuts (A$75 million).

Generally speaking, the subdivision of Vietnam's exports into separate world regions reveals the sensitivity of the constant market share analysis to each 'world' of trading partners that Vietnam engages. The world demand effect is a major factor for the expansion of Vietnam's exports in all markets, whereas the commodity composition and market distribution effects retarded its export growth. It is noticeable that, beside a general rise of world trade demand, the competitiveness effect was also a major source for Vietnam's exports success over this period.

So far, we have determined that the sources of Vietnam's exports growth were due to a general rise of world trade demand, except for two years 1998 and 2001, and a rising 'unexplained residual competitiveness' effect. However, there are various factors, macroeconomics as well as microeconomics, which constitute the competitiveness of a country. The following section uses the surveys of the World Economic Forum's global competitiveness ranking and its determinant factors of

[55] Source is UN Comtrade database.

competitiveness in search of Vietnam's sources of 'unexplained residual competitiveness'.

5.4 Global Competitiveness Ranking

5.4.1 ASEAN-5's Competitiveness Ranking

The analysis in Section 5.3 confirms that, over the period studied, the commodity composition and competitiveness effects retarding the growth for all the ASEAN-4, while the major source of Vietnam's export growth was the general rise of world demand and the 'unexplained residual competitiveness' effects. This section reinforces this unexplained residual competitiveness effect by presenting other studies on global competitiveness from the World Economic Forum's *Global Competitiveness Report* (GCR).[56]

Prior to 2000, the GCR was known as competitiveness index (CI) focusing on global competitiveness as the set of institutions and economic policies supportive of high rates of economic growth in the medium term (five years). Since 2001, the CI was renamed the growth competitiveness index (GCI) focusing on two separate but complementary approaches to the analysis of economic competitiveness. The first, led by Jeffrey Sachs and John McArthur of the Centre for International Development at Harvard University, strives to estimate the underlying conditions for growth over the coming five years, by focusing on the level of technology in an economy, the quality of public institutions, and the macroeconomic conditions related to growth. In addition, the second known as the current competitiveness index (CCI) and led by Michael Porter of the Institute for Strategy and Competitiveness at the Harvard Business School, attempts to evaluate the underlying conditions defining the current level of productivity by employing microeconomic indicators (e.g. institutions, market structures and economic policies supportive of high current levels of prosperity) referring mainly to an economy's efficient operation of its current stock of resources. These two indexes, GCI and CCI, provide valuable insights into sources of national competitiveness. According to World Economic Forum (2001: 3):

[56] Also, other institutions that study on global competitiveness ranking are the World Bank's Doing Business database and the International Institute for Management Development (IMD).

> Both the GCI and CCI combine hard data and unique survey data to assess competitiveness in a large sample of countries. Centre to both indexes is the Executive Opinion Survey,[57] conducted annually by the World Economic Forum. The Survey is indispensable to the Report, since no reliable hard data sources exist for many of the most important aspects of an economy such as the efficiency of government institutions, the sophistication of local supplier networks, or the nature of competitive practices. Even where hard data are available, the data often do not cover all the countries in our sample. The Executive Opinion Survey records the perspectives of business leaders around the world by asking them to compare aspects of their local business environment with global standard.

Since 2004, Sala-i-Martin has developed a new comprehensive competitiveness model for the World Economic Forum (WEF). This new *global competitiveness index* (GCI) improves the concepts and ideas underpinning the earlier Growth Competitiveness Index by incorporating and evaluating more additional competitive factors such as infrastructure, health and primary education, higher education and training, business sophistication and innovation.

According to World Economic Forum (2006: 11), the new index is an improvement on the previous one as it captures a much more sophisticated concept of competitiveness, and it does so in a much more realistic way by distinguishing between the competitiveness of the poor and the competitiveness of the rich. The concept of stages of development is introduced in three different stages,[58] based on the idea that as countries move along the development path, wages tend to increase, and that in order to sustain this higher income, labour productivity must improve. The first stage is *factor-driven* economies, which compete based on their factor endowments, primarily unskilled labour and natural resources. To do this well, developing countries need not only a cheap labour force, but educated and healthy

[57] The recently launched *Global Competitiveness Report 2008-2009* polled over 12,000 business executives worldwide.

[58] Stage 1: Factor-driven where a country's GDP per capita is less than US$2,000. Stage 2: Efficiency-driven where a country's GDP per capita is between US$3,000 and US$9,000. Stage 3: Innovation-driven where a country's GDP per capita reaches more than US$17,000. The gap in between each stage is the transition stage.

one, and also good institutions and good macroeconomic environment. As wages rise with advancing development, countries move into the *efficiency-driven* stage of development, when they must begin to develop more efficient production processes and increase product quality. At this point, competitiveness becomes increasingly driven by higher education and training, efficient markets and the ability to harness the benefits of existing technologies. Finally, as countries move to the *innovation-driven* stage, in order to sustain higher wages and maintain good living standard, they must compete with new and unique products. At this stage, companies must compete through innovation. Table 5.11 summarises the three stages of development with their essential composition in each development stage.

It is noted that, according to the WEF's classification, while Vietnam and Indonesia are in stage 1 of development, Malaysia and Thailand are in stage 2 and China is in transition from stage 1 to stage 2.

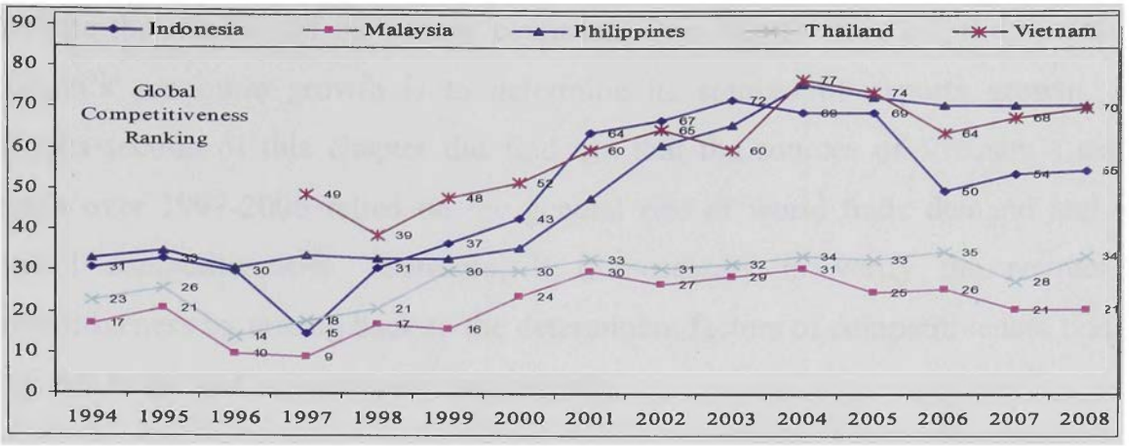
Table 5.11: Composition of Competitiveness

Basic Requirements • Institutions • Infrastructure • Macroeconomic stability • Health and primary education	→	Key for **factor-driven** economies
Efficiency Enhancers • Higher education and training • Goods market efficiency • Labour market efficiency • Financial market sophistication • Technology readiness • Market size	→	Key for **efficiency-driven** economies
Innovation and Sophistication Factors • Business sophistication • Innovation	→	Key for **innovation-driven** economies

Source: World Economic Forum, *Global Competitiveness Report 2008-09.*

The rank that the WEF allocates to a particular country follows the ascending order. It is therefore the higher rank the worse the economy, and the lower rank the better its competitiveness. Figure 5.9 presents the ASEAN-5's global competitiveness rankings from 1994 to 2008. In general, except Malaysia from 2005, all the ASEAN-5's competitiveness obviously has experienced a declining trend (moving upwards) over this period.

Figure 5.9: ASEAN-5's Global Competitiveness Rankings, 1994-2008



Note: Vietnam's data is available only from 1997.
Source: World Economic Forum, *Global Competitiveness Report 2008-09.*

Among the ASEAN-5, Malaysia's competitiveness ranking is highest, followed by Thailand, the Philippines and Indonesia. Vietnam's ranking (60th) was higher than Indonesia (72nd) and the Philippines (66th) only in 2003. Since then, Indonesia's competitiveness has improved amazingly, overtaking the Philippines from 2004, while Vietnam's competitiveness fluctuated around 70th ranking until 2008.

It is noted that, although the WEF inserts a couple of developing countries into its study sample each year; these new countries' rankings, however, are below those of the ASEAN-5; the end result therefore does not affect the ASEAN-5's rankings as discussed above. Also, the WEF's global competitiveness index[59] is evaluated and ranked based on various factors constituting a country's economy as a whole. Nevertheless the GCI is useful in assessing the competitive stand of a country's exports in the global trading network as well as in tracing the sources of competitiveness in exports.

5.4.2 ASEAN-5's Sources of Competitiveness in 2008

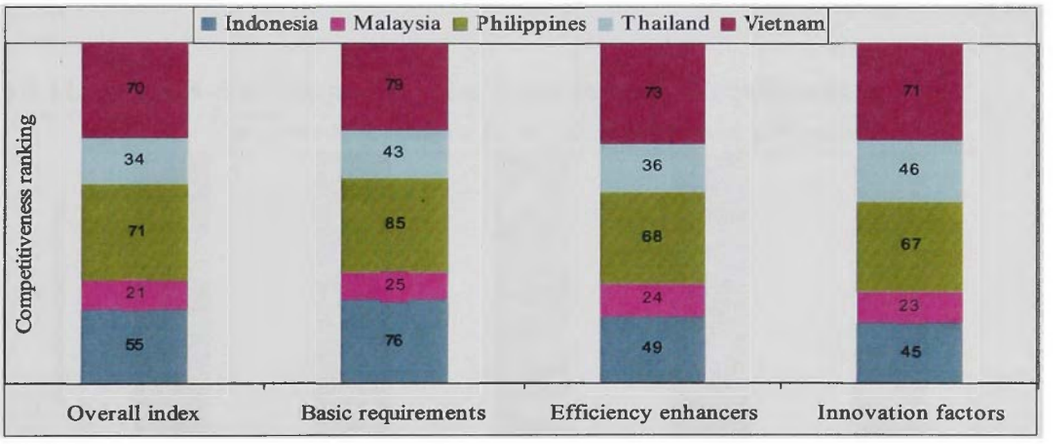
While the WEF combines and evaluates many determinant factors to produce the GCI as summarised in Table 5.11 above, the constant market share model evaluates the growth of a country by decomposing its aggregate exports growth into four various effects, in which one is called 'unexplained residual competitiveness'. This residual

[59] There are 122 countries in the global competitiveness index rankings for 2006-07; 131 countries for 2007-08 and 134 countries for 2008-09.

competitiveness can be explained as an increasing capacity of Vietnam's exports to penetrate the markets of its partner countries. One way to trace out the sources of Vietnam's economic growth is to determine its sources of exports growth. The previous section of this chapter did find out that the sources of Vietnam's export growth over 1997-2006 relied on the general rise of world trade demand and this residual competitiveness. Therefore, it is necessary to verify the sources of competitiveness by tracing back to the determinant factors of competitiveness that the WEF has employed to yield such above results.

Figure 5.10 presents the ASEAN-5's overall competitiveness index in 2008, decomposing into three subindexes that form the key factors for three stages of economic development, such as basic requirements, efficiency enhancers and innovation and sophistication factors as discussed above. Meanwhile, the following figures 5.11 to 5.13 illustrate each of these subindexes together with its constituted factors.

Figure 5.10: ASEAN-5's Competitiveness Index decomposing to 3 Subindexes, 2008



Source: World Economic Forum, *Global Competitiveness Report 2008-09.*

In general, among the ASEAN-5, Malaysia and Thailand respectively are leaders in competitiveness over the period studied with ranking of 21st and 34th in 2008. Indonesia occupied the third position (55th) before Vietnam (70th) and the Philippines (71st). It should be mentioned here that, in calculating the global competitiveness index, the WEF allocates the weights of these key factors according to each country's stage of economic development as mentioned in footnote 62. Table 5.12 shows this weighting allocation as follows.

Table 5.12: Weighting of Subindexes at each Stage of Development

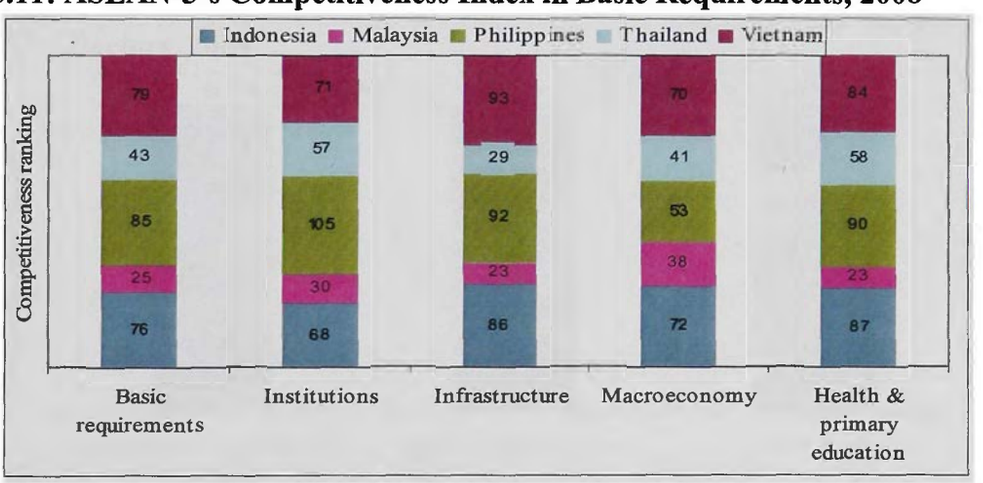
Weights	Basic Requirements	Efficiency Enhancers	Innovation and Sophistication factors
Factor-driven stage	50%	40%	10%
Efficiency-driven stage	40%	50%	10%
Innovation-driven stage	30%	40%	30%

Source: World Economic Forum, *Global Competitiveness Report 2008-09.*

In basic requirements, Vietnam (79th) was behind Indonesia (76th) but in front of the Philippines (85th). In efficiency enhancers and innovation factors, Vietnam was ranked the worst at 73rd and 71st after the Philippines at 68th and 67th while Indonesia was better than the Philippines at 49th and 45th respectively.

The ASEAN-5's basic requirements index (decomposed into institutions, infrastructure, macroeconomic stability, and health and primary education) is presented in Figure 5.11. Compared only with the two latecomers of the ASEAN-4, Vietnam was better than Indonesia in macroeconomic stability, while Vietnam led the Philippines in institutions and was in better position than these two countries in health and primary education.

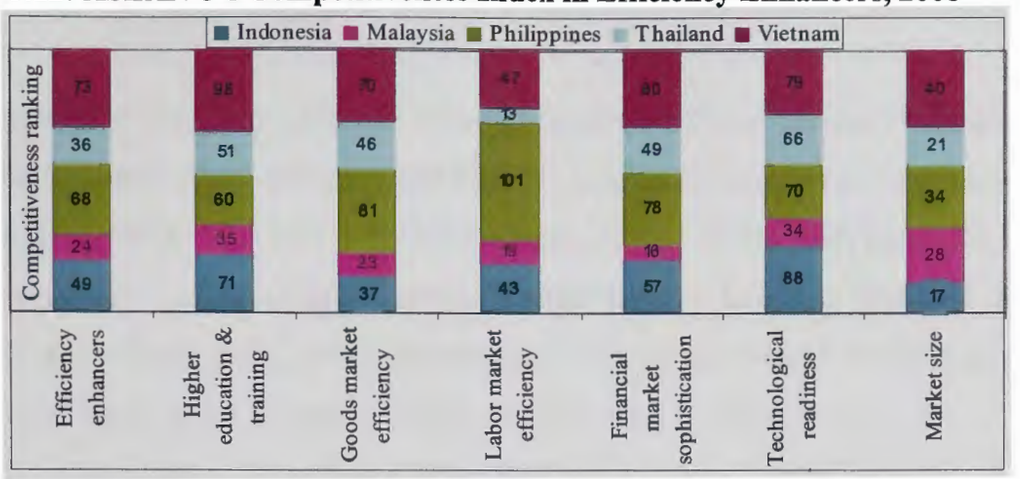
Figure 5.11: ASEAN-5's Competitiveness Index in Basic Requirements, 2008



Source: World Economic Forum, *Global Competitiveness Report 2008-09.*

Nevertheless, at higher level of economic development in efficiency enhancers and innovation and sophistication factors, Vietnam was ranked the last with the exception of factors such as goods market efficiency, labour market efficiency and innovation in which Vietnam was in better position than the Philippines.

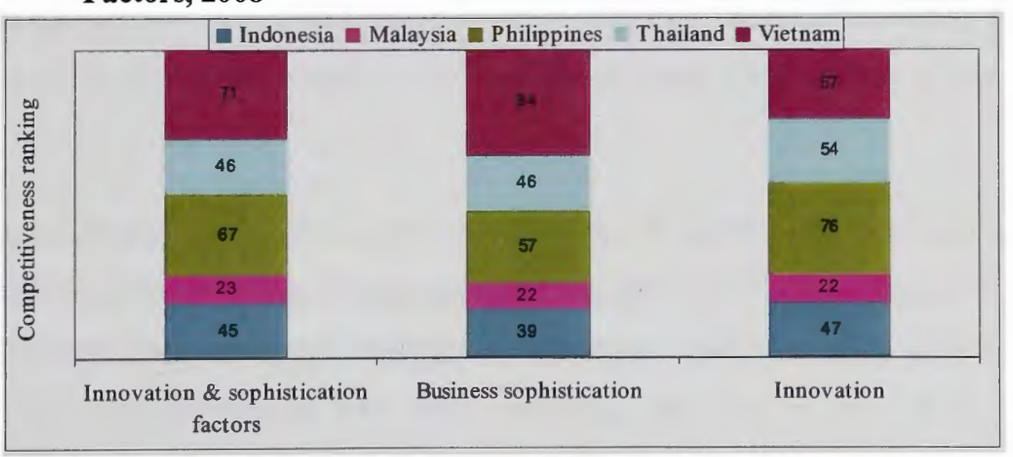
Figure 5.12: ASEAN-5's Competitiveness Index in Efficiency Enhancers, 2008



Source: World Economic Forum, *Global Competitiveness Report 2008-09.*

Therefore, the 'unexplained residual competitiveness' effect in Vietnam's export growth so far is still a 'mystery' as none of the factors that have been used by the WEF in establishing the global competitiveness index can explain the competitiveness of Vietnam's exports over the period studied. In other words, although Vietnam's power of global market penetration has increased but its rankings based on the efficiency of economic structural and institutional changes, have diminished over this period.

Figure 5.13: ASEAN-5's Competitiveness Index in Innovation and Sophistication Factors, 2008



Source: World Economic Forum, *Global Competitiveness Report 2008-09.*

5.5 Conclusion

It appears that the two external demand-oriented effects of world demand and commodity composition for some particular industries tended to have the same effect on each of the ASEAN-5 in a fairly analogous manner. On the other hand, the internal supply-oriented competitiveness effect, varied largely between Vietnam and the ASEAN-4. In other words, the characteristics of Vietnam's export structure have been different to those of the second tier NICs as confirmed in Chapter Four.

This chapter investigates the sources of export growth by using two approaches. The first one is the constant market share model in which the empirical analysis shows that the commodity composition and market distribution effects, each had a negative impact on Vietnam's exports, while the sources of export growth in Vietnam over the period studied were the general rise of world trade demand and an unexplained residual competitiveness effects. Thus, Vietnam's export growth was supported by strong growth in world trade over the period, but hindered by the commodity composition of those exports and by the nature of the markets to which Vietnam exports. In this context, a key factor driving exports was an increasing capacity of Vietnam's exports to penetrate the markets of its partner countries. This increasing residual competitiveness is not explained by this analysis, but may reflect the fact that Vietnam is an emerging exporter with low labour costs starting from a low export base.

The second approach uses the survey results of the World Economic Forum's global competitiveness index, based on perceptions of the efficiency of an economy's macro- and microeconomic structural changes, which shows that Vietnam's structural and institutional competitiveness has been declining, and has become quite low in international terms.

These two findings stand in apparent opposition to one another. The constant market share model shows that a rising revealed competitiveness has driven Vietnam's exports during this period, and offset the disadvantage of poor commodity and market composition. On the other hand the WEF's surveys suggest that Vietnam's

international competitiveness is low and has been declining in recent years. One possible explanation, consistent with the findings of Chapters Three to Five to date, is that the rising revealed competitiveness reflects Vietnam's ability to develop, with the use of foreign capital, increased production and exports in labour-intensive industries, even as its ability to compete in higher value goods and service industries, falls away. The attempt to interpret this apparent opposition, and its implications for the quality of Vietnam's economic growth to date and of its future prospects, will be an important aspect of the concluding chapters of this thesis.

Meanwhile, the next Chapter Six will look at Vietnam's export structure in relation to that of the ASEAN-4, and its future development path? Then, part III of this thesis consisting of chapters 7 and 8 will explore the potential of Vietnam's exports and the quality of its economic growth.

Chapter Six

COMPARATIVE EXPORT STRUCTURE AND VIETNAM'S DEVELOPMENT PATH

6.1 Introduction

Vernon's product life-cycle theory attempts to explain the shift of mature industries out of the inventing country and into low-cost, labour-intensive developing countries. This is also one of the stages of a generally accepted theory in development economics, which view the dynamic development of comparative advantage of poor countries as following a well-established pattern. According to Balassa (1979), as a country progresses, the commodity composition of its exports will change according to its changing comparative advantage. Hence the pattern of trade and the resultant division of labour will be subject to dynamic change in a rapidly growing economy. The earliest stage is associated with a dependence on exports of primary products. The second stage consists of a shift to exports of products closely related to the available raw materials. The third stage is the exports of simple, labour-intensive consumer goods. The fourth stage will be a shift to more sophisticated capital goods, and finally there is a shift to R&D or technology-intensive goods. This 'five-stages of exports' model provides a rough model against which the trade pattern and export composition of Vietnam and the ASEAN-4 in the period studied will be assessed.

The UNIDO (1982: 3) states that:

> Economies are in a state of constant flux because of structural forces-technological advances, the accumulation of capital, the growth of skilled labour, changes in taste etc., which may alter international patterns of comparative advantage. As a result, a country's ability to carry out various types of industrial activity efficiently can change over time. These changes have an uneven effect on industry in that a country may become more efficient in producing some manufactured products in place of others. As resources and other economic

> inputs are redirected to new activities, some industries are destined to contract in terms of their shares in production, employment, investment or exports. A contraction in one branch (e.g. textiles) is usually accompanied by a corresponding expansion elsewhere in manufacturing (e.g. electronics or capital goods) or in another sector of the economy (e.g. services).

As mentioned earlier in Chapter Four about the shifts of comparative advantages of some product categories from each country of the ASEAN-4 to Vietnam, as well as which countries of the ASEAN-4 have competed with Vietnam in the global market. There are two possible hypotheses raised in this chapter.

- Is there a shift in comparative advantage from the ASEAN-4 to Vietnam for some particular export products, when an increase in Vietnam's world shares of these products accompanied by the ASEAN-4's declines in their world shares of these respective exports?
- Is there competitiveness or complementarity between some of Vietnam's and the ASEAN-4's exports when there are high negative (or positive) correlations between their world share growths of these respective exports?

Among the ASEAN-5, Vietnam is a latecomer who has been struggling to catch up the other countries in the group since its 'open-door' policy was implemented in 1986. In Vietnam's Sixth Communist Party politburos general meeting in 1986, one of the objectives declared was that Vietnam would become a newly industrialising country by the year 2020. At the United Nations' Millennium Summit in New York (6-8 September 2000), the then President of the Socialist Republic of Vietnam, Mr. Tran Duc Luong (2000) also reconfirmed:

> On the strength of the great achievements recorded over the past 15 years of Doi-Moi (renovation) such as high and stable economic growth and the improvement of peoples' lives in every aspect, we are doing our utmost to bring our country to a higher stage of development, that of modernisation and industrialisation with the objective of making our country a newly industrialising country by 2020.

Regrettably that so far, there is no officially specific definition on the term 'newly industrialising country'. However, Wikipedia states that NICs are countries whose

economies have not yet reached first world status but have, in a macroeconomic sense, outpaced their developing counterparts.[60] Another characterisation of NICs is that of nations undergoing rapid economic growth (usually export-oriented). Incipient or ongoing industrialisation is an important indicator of a NIC. In many NICs, social upheaval can occur as primarily rural, agricultural population migrates to the cities, where the growth of manufacturing concerns and factories can draw many thousands of labourers. NICs usually share some other common features, including:

- increased social freedoms and civil rights;
- a switch from agricultural to industrial economies, especially in the manufacturing sector;
- an increasingly open-market economy, allowing free trade with other nations in the world;
- large national corporations operating in several continents; and
- strong capital investment from foreign countries.

Apart from these common features, in this thesis, a newly industrialising country is simply defined as a country whose total GDP is constituted by less than 20 per cent of agricultural output, and more than 50 per cent of combined output of manufacturing and non-manufacturing industry sector.

Besides studying those questions mentioned above, this chapter will also investigate the structure of Vietnam's exports in relation to the ASEAN-4, the lead-lag relationship between them, and the implications of continuing the current pattern of Vietnamese development through to 2020 to assess its target of turning to a newly industrialising country by that time. In particular, this chapter is structured as follows. Section 6.2 discusses Finger and Kreinin's export similarity index that is used to examine the export patterns of the ASEAN-5 with those of South Korea, one of the first tier NICs, to uncover the exports overlap between these countries. Section 6.3 investigates the ASEAN-5's export competitiveness versus complementarity in the world market by testing the Spearman rank correlation coefficients of the revealed comparative advantage indices as discussed in Chapter Four. Section 6.4 examines the

[60] Viewed at http://en.wikipedia.org/wiki/Newly_industrialized_country

lead-lag relationship between them by using (a) the similarity index; (b) the non-parametric tests (Spearman rank correlation) on revealed comparative advantage index; and (c) the GDP per capita and assesses whether Vietnam would become a newly industrialising country by 2020, while Section 6.5 discusses the implications of Vietnamese development on continuing the 2000-06 growth pattern towards 2020. Finally, Section 6.6 summarises and concludes the chapter.

6.2 Export Similarity Index

6.2.1 Methodology of Finger and Kreinin Index

The export similarity index measures the similarity of any pair of countries' exports (or groups of countries) to a third market. This index was firstly used by Mac Dougall (1952) who describes the export similarity index as the ratio of the product elasticity of substitution between imports from two different sources to the aggregate elasticity of substitution of imports from those sources. Finger and Kreinin (1979) point out: 'the Mac Dougall index is sensitive to the relative scale of exports of the two exporters, and tends toward unity when one exporter is notably larger than the other'. They then proposed a different index to determine the overlap of export products between two (or more) countries. An advantage of Finger and Kreinin's index is that it requires only international trade data, which are usually available from various international databases. According to Finger and Kreinin (1979: 905):

> A number of propositions in international economics can be examined by the use of an index. First, the General System of Preferences (GSP) granted by all industrial countries to the manufacturing exports of LDCs. Theoretically, such preferential treatment in favour of LDCs gives rise to two effects: trade creation and trade diversion. The latter effect would be important if and only if LDCs export the same type of commodities as DCs to the market of the donor countries. If exports are dissimilar (subject to little or no commodity overlap) then there is little scope for trade diversion. Secondly, in GATT negotiated tariff reductions, the LDCs receive all concessions negotiated among the industrial countries without themselves having to reciprocate. But the concessions exchanged among the industrial countries are usually in commodity categories that these countries export to each other. Only to the extent that LDCs' exports to

> OECD countries overlap the commodities exchanged by the DCs themselves, would any benefits flow to the LDCs from such GATT tariff cuts. Finally, one can observe changes over time in the similarity of exports between any two countries or groups of countries, and thereby assess the degree to which their economic structure is becoming more similar or more divergent.

The export similarity index of Finger and Kreinin is defined by the formula:

$$Si(ab,c) = \{ \sum_{i} Minimum[Xi(ac), Xi(bc)] \} * 100 \qquad [6.1]$$

where: $S_i\,(ab,\ c)$ = similarity between exports of commodity i of country a and b to a common market c;

$Xi\ (ac)$ = the share of commodity i in country a's exports to c; and

$Xi\ (bc)$ = the share of commodity i in country b's exports to c.

Equation [6.1] implies that, if the commodity distribution of *a's* and *b's* exports are identical [$Xi\ (ac) = Xi\ (bc)$ for each i], then the index takes on the value of 100. If *a's* and *b's* export patterns are totally dissimilar (for each $Xi\ (ac)>0,\ Xi\ (bc) = 0$, and vice versa), the index will take on the value of zero.

It is noted that the common market c here for the ASEAN-5 countries is the total world trade.

6.2.2 Results of Finger and Kreinin Index

The similarity indices presented in Table 6.1 are calculated based on the ASEAN-5's 247 product categories at the 3-digit SITC level (Revision 3), and aggregated at twenty-three product groups as shown in previous chapters.

In primary products group,[61] Vietnam's and Indonesia's exports were more analogous than other countries with an average product overlap of 33 per cent over 1997-2003; while the average export similarity indices of this sector for Malaysia and Thailand were 18 per cent, and for the Philippines was 6 per cent over the same period. It is also noted that the most similarity in exports overlap between Indonesia and Vietnam

[61] Primary products group contains food, raw materials, ores and other minerals, fuels, and non-ferrous metals.

was in fuels (22.3 per cent average) and in food (7.5 per cent average), while the average indices for Malaysia-Vietnam in fuels and food were 8.5 and 6.6 per cent respectively. As for the Philippines and Thailand, the exports overlap with Vietnam was highest in food with 3.4 and 12.5 per cent respectively while these indices for fuels were very low with 1.1 and 2.5 per cent respectively in the same period.

Table 6.1: Similarity Index between Vietnam's and ASEAN-4's Exports, 1997-2003 (%)

	1997	1998	1999	2000	2001	2002	2003	1997-2003
Primary								
Indonesia	32.2	27.1	33.3	34.8	34.3	34.2	33.6	32.8
Malaysia	19.5	17.9	16.1	16.8	17.3	17.5	20.2	17.9
Philippines	7.9	6.0	4.2	5.1	5.2	5.0	6.1	5.6
Thailand	20.0	18.6	17.6	16.9	17.3	20.1	15.9	18.1
Manufactures								
Indonesia	28.7	32.8	36.1	33.0	35.9	32.2	32.9	33.1
Malaysia	23.1	22.1	24.3	22.3	23.9	22.9	23.6	23.2
Philippines	29.1	26.1	23.5	24.6	26.7	23.5	23.9	25.3
Thailand	32.5	30.6	33.0	30.7	32.2	29.6	29.8	31.2
Total Merchandises								
Indonesia	60.9	59.9	69.4	67.9	70.2	66.5	66.5	65.9
Malaysia	42.6	40.0	40.4	39.1	41.2	40.5	43.8	41.1
Philippines	37.0	32.1	27.7	29.7	31.9	28.5	30.0	30.9
Thailand	52.5	49.2	50.6	47.6	49.5	49.7	45.7	49.2

Source: Author's calculation based on UN Comtrade database.

In manufactures,[62] the exports overlap between Vietnam and Indonesia to the world market was also highest with an average similarity index of 33 per cent, followed by Thailand (31 per cent); then the Philippines and Malaysia with 25 and 23 per cent respectively. Likewise, Indonesia-Vietnam's manufactured exports overlap was high on average in the following groups: clothing (7.0 per cent, LT),[63] personal and household goods (5.5 per cent, LT), other semi-manufactures (4.0 per cent, LT), other products (3.0 per cent, LT) and textiles (2.5 per cent, LT). The exports overlap in other groups was insignificant and thus not mentioned here. High overlap indices for other pairs of countries were recorded as follows:

[62] Manufactures consist of iron and steel, pharmaceuticals, other chemicals, other semi-manufactures, electronic data processing and office equipment, telecommunications equipment, integrated circuit and electronic components, automotive products, other transport equipment, power generating machinery, non-electrical machinery, electrical machinery, textiles, clothing, personal and household goods, scientific and controlling instrument, miscellaneous manufactures, and other products.

[63] Note that LT = low-technology; ML = medium-low technology; MH = medium-high technology; HT = high-technology; and N = natural resource-based industries.

- *Malaysia-Vietnam*: other semi-manufactures (3.7 per cent, LT), electronic data processing and office equipment (3.0 per cent, HT), electrical machinery (2.6 per cent, MH), clothing (2.4 per cent, LT), personal and household goods (2.0 per cent, LT) and miscellaneous manufactures (2.0 per cent, HT).
- *Philippines-Vietnam*: clothing (7.4 per cent, LT), electronic data processing and office equipment (3.0 per cent, HT), personal and household goods (2.7 per cent, LT), electrical machinery (2.6 per cent, MH) and miscellaneous manufactures (2.0 per cent, HT).
- *Thailand-Vietnam:* clothing (5.8 per cent, LT), personal and household goods (4.4 per cent, LT), other semi-manufactures (3.7 per cent, LT), electronic data processing and office equipment (3.0 per cent, HT), electrical machinery (2.6 per cent, MH), textiles (2.5 per cent, LT) and miscellaneous manufactures (2 per cent, HT).

Overall, Vietnam's and the ASEAN-4's similarity of manufactured exports has been greater than that of the primary sector over the period studied. Looking at the economic structure as a whole over that period, it appears that the export products' overlap between Vietnam and Indonesia was increasing and highest with a similarity index of 66 per cent average, while that of other countries in the group was decreasing with 41 per cent average for Malaysia, 31 per cent for the Philippines and 49 per cent for Thailand. It is worth to note that Vietnam-Indonesia's export structure has become more analogous over that period, while this has turned out to be less similar in the case of Malaysia, the Philippines and Thailand. However, these export similarity indices between Vietnam and all the ASEAN-4 are generally regarded as high.

The higher the export similarity index, the more exports overlap between the two countries and the higher the competitive status between them. Nevertheless, this hypothesis is only true when the world demand (or market demand) for those export products is smaller than the supply of those products by these countries and the rest of the world. On the contrary, when the world demand is higher than the world output, the situation turns out to be a complement in exports between these countries.

If we accept the above hypothesis, then it appears that Indonesia has been Vietnam's vigorous rival in the global market, followed by Thailand, Malaysia and the Philippines. Having said this, another interesting question arising here is what product groups Vietnam and the ASEAN-4 have competed on over this period? Is it true that, among the ASEAN-5, Indonesia has been Vietnam's strongest competitor in the world market?

The following section will assess the competitiveness versus complementarity of the ASEAN-5's exports in the world market by conducting some non-parametric tests on the ASEAN-5's 247 product categories, aggregated to twenty-three product groups.

6.3 ASEAN-5's Exports: Competitiveness or Complementarity in the World Market?

To study the trading relations among the sixteen individual countries and two residual groups of countries (developed and developing), consisting of the industrialised ones, the NICs and other developing nations, Lutz (1987) uses the correlation coefficients of changes in export shares for the selected three-digit SITC categories for two time periods, 1968 to 1976 and 1976 to 1982, between pairs of countries to determine the likely shifts of comparative advantage between them. In the case of the developed countries group, it was expected there would be strong negative associations, particularly with the NICs. The negative associations between a group of countries with declining shares and the NICs with expanding export shares would indicate that the NICs had indeed gained markets at the expense of the industrialised ones. Similarly, as for shifts from the NICs to other developing countries, if such changes were taking place, there would be a negative correlation between them. Conversely, if both countries (or groups of countries) gained their shares of exports on these product groups, then Lutz suggested the positive correlations would support the argument that no evidence of such shifting of comparative advantage has occurred between pairs of countries, but rather their export growths were complimentary with each other in the world market.

In this section, we use Lutz's methodology to determine whether there was competitiveness or complementarity between Vietnam's and the ASEAN-4's exports

over 1997-2003; and whether there have been probable shifts of comparative advantages in some particular product categories from each country of the ASEAN-4 to Vietnam. However, instead of using simple market shares like Lutz, we use the revealed comparative advantage indices, which reveal not only the relative market shares of specific product groups, but also reflect their competitiveness in the global trading network. This also has been used by Chow and Kellman (1993) in their study on the first-tier NICs.

If the Spearman rank correlation coefficients for a pair of countries in the same product groups are positively correlated over the period studied, then we would expect that their exports expansion is moving in the same direction, and thus there is no competition but rather a complementary status formed between them. On the contrary, if the results show that the relationship is negatively correlated, then the pair of countries has been competing with each other in the world market. The country that experienced increasing revealed comparative advantage in a specific product group at the expense of the other with declining comparative advantage would be the winner in that export area, while the latter would be the loser.

Results of the average percentage of competitive product groups showing in the last row of Table 6.2, once again, confirm that Vietnam's vigorous rival in international trade was Indonesia as analysed in the last section by using the similarity index criterion, followed by the Philippines with 43 per cent, and Malaysia and Thailand with 39 and 35 per cent respectively. It should be noted that the above estimation certainly provides a rough idea only about the degree of competitiveness in merchandise exports between Vietnam and the ASEAN-4.

Also, it is worth to note that clothing and personal and household goods (low-tech) were the only two product groups that Vietnam has competed with each single country of the ASEAN-4, strongest with Indonesia in clothing and with Thailand in personal and household goods. On the other hand, there were four complementary product groups that all the ASEAN-5 countries have supplied to the global market; two in the primary sector and the other two in the manufacturing sector. The former were raw materials and fuels; and the latter were pharmaceuticals and other

chemicals. This also signifies that there has been a great demand in the world market for these product groups.

Table 6.2: ASEAN-5's Spearman Rank Correlation Coefficients between RCA Indices for 23 Selected Product Groups, 1997-2003

	ISIC Rev. 2	Indonesia/ Vietnam	Malaysia/ Vietnam	Philippines/ Vietnam	Thailand/ Vietnam
Food	LT	-0.357	0.107	0.464	0.571
Raw materials	NR	0.750	0.179	0.600	0.857*
Ores & other minerals	NR	0.679	-0.541	-0.703	0.071
Fuels	NR	0.750	0.214	0.342	0.036
Non-ferrous metals	ML	-0.546	0.537	0.073	-0.346
Iron & steel	ML	-0.193	0.312	-0.953**	0.691
Pharmaceuticals	HT	0.000	0.825*	0.840*	0.809*
Other chemicals	MH	0.468	0.743	0.000	0.633
Other semi-manufactures	ML	0.234	0.334	-0.126	0.179
EDP & office equipment	HT	-0.214	0.071	-0.714	0.393
Telecom equipment	HT	-0.162	0.414	0.631	0.847*
IC & electronic components	HT	-0.734	0.144	0.198	-0.455
Automotive products	MH	0.962**	-0.843*	0.661	0.945**
Other transport equipment	MH	-0.018	-0.873*	0.218	0.109
Power generating machinery	HT	0.703	-0.857*	-0.775*	-0.464
Non-electrical machinery	MH	-0.596	0.000	-0.528	0.119
Electrical machinery	MH	0.143	-0.162	-0.252	0.286
Textiles	LT	0.857*	-0.643	-0.667	-0.450
Clothing	LT	-0.703	-0.321	-0.179	-0.306
Personal & household goods	LT	-0.200	-0.342	-0.357	-0.500
Scientific & controlling inst.	HT	0.530	0.837*	0.213	-0.046
Miscellaneous manufactures	HT	-0.593	0.250	0.649	0.357
Other products	LT	0.827*	-0.342	0.818*	-0.119
Average percentage of competitive product groups		**48%**	**39%**	**43%**	**35%**

Notes: a) ISIC = International Standard Industrial Classification (Revision 2). NR = natural resource-based; LT = low-technology; ML = medium-low technology; MH = medium-high technology; HT = high-technology; b) * is correlation significant at the 0.05 level, while ** is correlation significant at the 0.01 level and no * denotes that correlation is significant at the 0.10 level; c) 23 product groups aggregated from 247 product categories at the 3-digit SITC (rev. 3) level; d) SPSS outputs are in Table A6.1.
Source: Author's calculation based on UN Comtrade database.

By and large, in low value-added labour-intensive groups such as textiles, clothing, personal and household goods, and other products, Vietnam's strong competitor was Malaysia and Thailand; while in high-technology intensive groups, Vietnam has struggled with the strong rivalry from Indonesia in four competitive product groups,[64] in two for Thailand,[65] and in power generating machinery for Malaysia and the Philippines. Meanwhile, Vietnam strongly competed in medium-low-tech products

[64] Indonesia: electronic data processing and office equipment; telecommunications equipment; integrated circuit and electronic components; and miscellaneous manufactures.

[65] Thailand: integrated circuit and power generating machinery.

such as iron and steel with Indonesia and the Philippines; with Malaysia in three groups of medium-high-tech industries,[66] in two groups with the Philippines[67] and in non-electrical machinery with Indonesia.

In the primary sector, Vietnam's strong rival was Indonesia, competing in food and non-ferrous metals, while at the same time vying strongly with Malaysia and the Philippines in ores and other minerals, and with Thailand in non-ferrous metals.

The following sub-sections will discuss in detail the competitiveness of export product categories between Vietnam and the ASEAN-4, and then identify which product categories' comparative advantages have been shifted from any of the ASEAN-4 to Vietnam over this period. Competitiveness is considered 'strong' when the Spearman rank correlation coefficients are greater than 0.5 and 'moderate' when they are less than 0.5. It should be noted that after the Spearman coefficient is identified negatively correlated for competitiveness between the two countries' product group, the next step is to observe the RCAs patterns of all product categories within that group over the time series (1997-2003) to identify the possible shift of each product category from the ASEAN-4 to Vietnam. Possible shifts only occur when Vietnam's RCAs pattern of a particular product category increases, while that of another country decreases. It should also emphasise that the market here is the world market in general.

6.3.1 Vietnam-Indonesia: 48% Competitive Export Products

The product groups that Vietnam and Indonesia appeared strongly competing in were:

- *Food*: tobacco, un-manufactured tobacco (SITC 121); fish, dried, salted, smoked (SITC 035) and fish etc., prepared, preserved n.e.s. (SITC 037).
- *Non-ferrous metals*: tin (SITC 687).
- *Integrated circuit and electronic components*: transistors, valves, etc. (SITC 776).
- *Non-electrical machinery:* ball or roller bearings (SITC 746).

[66] Malaysia: automotive products, other transport equipment and electrical machinery.

[67] Philippines: electrical machinery and non-electrical machinery.

- *Clothing:* men, boys, clothing, x-knit (SITC 841); clothing accessories, fabric (SITC 846) and clothing, non-textile, headgear (SITC 848).
- *Miscellaneous manufactures:* office, stationery supplies (SITC 895, LT); gold, silverware, jewellery n.e.s (SITC 897) and miscellaneous manufactured goods n.e.s (SITC 899).

Concurrently, moderate competition was evidenced in:

- *Iron and steel*: flat-rolled plated iron (SITC 674).
- *Electronic data processing and office equipment:* parts for office machines (SITC 759).
- *Telecommunications equipment:* television receivers etc. (SITC 761); radiobroadcast receivers (SITC 762) and telecom equipment, parts n.e.s. (SITC 764).
- *Personal and household goods*: trunk suitcases, bag, etc. (SITC 831) and footwear (SITC 851).

It appears that in the manufacturing sector, shifting of comparative advantage from Indonesia to Vietnam has reflected in the following product categories:

- gold, silverware, jewellery n.e.s. (SITC 897); flat-rolled plated iron (SITC 674); parts for office machines (SITC 759) and footwear (SITC 851).

6.3.2 Vietnam-Malaysia: 39% Competitive Export Products

Vietnam's and Malaysia's strong competition was in the following product groups:

- *Ores and other minerals:* ore concentrate base metals (SITC 287) and stone, sand and gravel (SITC 273).
- *Automotive products:* passenger motor vehicles excl. bus (SITC 781) and goods, special transport vehicles (SITC 782).
- *Other transport equipment*: cycles, motorcycles, etc. (SITC 785) and trailers, semi-trailers etc. (SITC 786).
- *Power generating machinery*: rotating electric plant (SITC 716) and other power generating machinery (SITC 718).

- *Textiles*: textile yarn (SITC 651); cotton fabrics, woven (SITC 652); fabrics, man-made fibres (SITC 653); knitting crochet fabric n.e.s. (SITC 655); textile articles n.e.s. (SITC 658) and floor coverings etc. (SITC 659).

Other moderate competitive product groups were:

- *Electrical machinery*: electric power machinery, parts (SITC 771); electric switch relay circuit (SITC 772); electric distributor equipment n.e.s. (SITC 773); domestic electric, non-electric equipment (SITC 775) and electric machines apparatus n.e.s. (SITC 779).
- *Clothing*: women, girl clothes, x-knit cloth x-knit (SITC 842); men, boys clothing knit (SITC 843); women, girls clothing knit (SITC 844); other textile apparel, n.e.s (SITC 845); clothing accessories, fabric (SITC 846) and clothing, non-textile, headgear (SITC 848).
- *Personal and household goods:* furniture, cushions, etc. (SITC 821) and footwear (SITC 851).
- *Other products*: special transaction not classified (SITC 931).

It emerges that the product categories whose comparative advantages have been shifted from Malaysia to Vietnam over this period were:

- passenger motor vehicles excl. bus (SITC 781); cycles, motor cycles, etc. (SITC 785); trailers, semi-trailers, etc. (SITC 786); rotating electric plant (SITC 716); textile yarn (SITC 651); cotton fabrics, woven (SITC 652); fabrics, man-made fibres (SITC 653); knitting crochet fabric n.e.s. (SITC 655); textile articles n.e.s (SITC 658); electric power machinery, parts (SITC 771); electric distributor equipment n.e.s. (SITC 773); women, girl cloth, x-knit cloth x-knit (SITC 842); men, boys clothing knit (SITC 843); women, girls clothing knit (SITC 844); other textile apparel, n.e.s. (SITC 845); clothing, non-textile, headgear (SITC 848); furniture, cushions, etc. (SITC 821) and footwear (SITC 851).

In other product categories, although negatively correlated, Malaysia experienced an increasing or stable trend of competitiveness and thus a shift in comparative advantage could not occur.

6.3.3 Vietnam-Philippines: 43% Competitive Export Products

Vietnam's and the Philippines' strong competition appears in the following product groups:

- *Ores and other minerals*: stone, sand and gravel (SITC 273); other crude minerals (SITC 278); iron ore, concentrates (SITC 281); ferrous waste and scrap (SITC 282) and ore, concentrate base metals (SITC 287).
- *Iron and steel:* iron, steel bar, shapes etc. (SITC 676); wire of iron or steel (SITC 678) and tubes, pipes etc., iron, stl. (SITC 679).
- *Electronic data processing and office equipment:* parts for office machines (SITC 759).
- *Power generating machinery:* rotating electric plant (SITC 716).
- *Non-electrical machinery*: heating, cooling equipment, parts (SITC 741); pumps n.e.s, centrifuges etc. (SITC 743); taps, cocks, valves, etc. (SITC 747); ball or roller bearings (SITC 746) and non-electric machines, parts etc. (SITC 749).
- *Textiles:* textile yarn (SITC 651); knitting crochet fabric n.e.s (SITC 655) and textile articles n.e.s (SITC 658).

The product categories that experienced moderate competition were:

- *Other semi-manufactures:* manufactured leather etc. n.e.s. (SITC 612); materials of rubber (SITC 621); articles of rubber n.e.s. (SITC 629); veneers, plywood etc. (SITC 634); clay, prefabricated construction materials (SITC 662); mineral manufactures, n.e.s. (SITC 663); pottery (SITC 666); metallic structures n.e.s. (SITC 691); wire products excl. electric (SITC 693); nails, screws, nuts, etc. (SITC 694); cutlery (SITC 696); household equipment n.e.s. (SITC 697) and manufactures base metals n.e.s. (SITC 699).
- *Electrical machinery*: electric distributor equipment n.e.s. (SITC 773) and electric machines apparatus n.e.s. (SITC 778).
- *Clothing:* women, girl cloth, x-knit cloth x-knit (SITC 842); men, boys clothing knit (SITC 843); women, girls clothing knit (SITC 844); other textile apparel, n.e.s. (SITC 845) and clothing, non-textile, headgear (SITC 848).

- *Personal and household goods:* furniture, cushions, etc. (SITC 821); footwear (SITC 851) and baby carriage, toys, games (SITC 894).

In the meantime, revealed comparative advantages had shown shifting from the Philippines to Vietnam in the following product categories:

- iron, steel bar, shapes etc. (SITC 676); pumps n.e.s, centrifuges etc. (SITC 743); taps, cocks, valves, etc. (SITC 747); non-electric machines, parts etc. (SITC 749); textile yarn (SITC 651); knitting crochet fabric n.e.s (SITC 655); textile articles n.e.s (SITC 658); manufactured leather etc. n.e.s (SITC 612); materials of rubber (SITC 621); articles of rubber n.e.s (SITC 629); veneers, plywood etc. (SITC 634); pottery (SITC 666); wire products excl. electric (SITC 693); nails, screws, nuts, etc. (SITC 694); cutlery (SITC 696); household equipment n.e.s (SITC 697); electric distributor equipment n.e.s (SITC 773); men, boys clothing knit (SITC 843); women, girls clothing knit (SITC 844); clothing, non-textile, headgear (SITC 848); furniture, cushions etc. (SITC 821) and footwear (SITC 851).

6.3.4 Vietnam-Thailand: 35% Competitive Export Products

Vietnam and Thailand have strongly competed only in one product group:

- *Personal and household goods:* furniture, cushions, etc (SITC 821); footwear (SITC 851) and baby carriage, toys, games (SITC 894).

Moderate competition was found in the following groups:

- *Non-ferrous metals:* tin (SITC 687).
- *Integrated circuit and electronic components:* transistors, valves, etc. (SITC 776).
- *Power generating machinery:* rotating electric plant (SITC 716).
- *Textiles:* textile yarn (SITC 651); cotton fabrics, woven (SITC 652); fabrics, man-made fibres (SITC 653); tulle, lace, embroidery etc. (SITC 656); textile articles n.e.s. (SITC 658) and floor coverings etc. (SITC 659).

- *Clothing:* women, girl cloth, x-knit cloth x-knit (SITC 842); men, boys clothing knit (SITC 843); women, girls clothing knit (SITC 844) and other textile apparel, n.e.s. (SITC 845).
- *Other products*: coin non-gold, non-current (SITC 964).

As mentioned earlier, Vietnam's strongest competitor in low value-added export products was Thailand, whose comparative advantages seemed to have shifted to Vietnam in these low-tech product categories, namely:

- furniture, cushions, etc (SITC 821); footwear (SITC 851); rotating electric plant (SITC 716); cotton fabrics, woven (SITC 652); fabrics, man-made fibres (SITC 653); textile articles n.e.s (SITC 658); women, girl cloth, x-knit cloth x-knit (SITC 842); men, boys clothing knit (SITC 843) and women, girls clothing knit (SITC 844).

6.4 ASEAN-5's Lead-Lag Relationship

To further investigate the position of Vietnam in relation to the ASEAN-4 to see whether Vietnam has been moving on or falling behind these countries, and whether Vietnam would become a newly industrialising country by 2020 as declared; in this section we apply the following techniques:

- similarity index (SI) as discussed in previous sections;
- non-parametric tests on revealed comparative advantage index (RCAI); and
- the use of GDP per capita.

To make the justification clearer and sensible, we bring in the first-tier NIC South Korea to compare with Vietnam and the ASEAN-4, in which Malaysia, Thailand and the Philippines have been considered as the 'second-tier' NICs.

6.4.1 Using Similarity Index

The previous sections of this chapter show that shifts of comparative advantages in a number of product categories between Vietnam and the ASEAN-4, in which Vietnam was the beneficiary. One way to consider the dynamic relationship of changing comparative advantage patterns in merchandise exports over time between Vietnam and South Korea and the ASEAN-4, is to compare Vietnam's exports composition in a recent-available-data year with that of South Korea's and the ASEAN-4's past years to detect a similarity. The highest similarity in export (economic) structure between a latecomer (Vietnam) and the advancers (ASEAN-4 and South Korea) in the past will relatively determine the development gap (lead-lag relationship) between them.

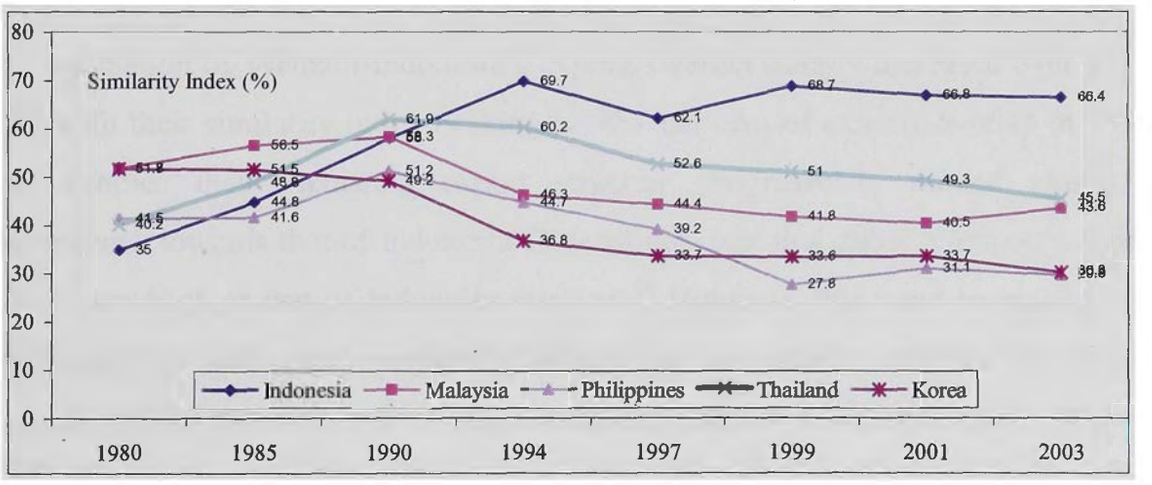
Again, the similarity indices for Vietnam's twenty-three product groups for 2003 have been used to compare with those of South Korea and of the ASEAN-4 for 1980, 1985, 1990, 1994, 1997, 1999, 2001 and 2003; and the results are reported in Table 6.3. However, it is much easier to observe the export similarity patterns between Vietnam and the others by Figure 6.1.

Table 6.3: Similarity Indices between Vietnam 2003's Exports Composition with those of South Korea and the ASEAN-4, Selected Years (%)

	1980	1985	1990	1994	1997	1999	2001	2003
Primary								
Indonesia	32.7	35.1	36.2	37.7	33.2	33.1	31.3	33.6
Malaysia	40.1	42.5	32.9	20.1	18.5	16.6	17.2	20.2
Philippines	21.5	21.5	22.0	17.0	7.9	4.1	5.0	6.1
Thailand	21.2	22.0	21.4	21.4	19.1	18.7	17.6	15.9
S. Korea	9.1	8.1	5.9	5.9	7.4	7.2	8.1	6.1
Manufactures								
Indonesia	2.3	9.7	21.8	32.0	28.9	35.6	35.5	32.9
Malaysia	11.7	14.0	26.5	26.2	25.9	25.2	23.3	23.6
Philippines	20.0	20.1	29.2	27.7	31.3	23.7	26.1	23.9
Thailand	19.0	26.8	40.5	38.8	33.5	32.3	31.7	29.8
South Korea	42.6	43.8	43.3	30.9	26.3	26.4	25.6	24.2
Total Merchandises								
Indonesia	35.0	44.8	58	69.7	62.1	68.7	66.8	66.4
Malaysia	51.8	56.5	58.3	46.3	44.4	41.8	40.5	43.6
Philippines	41.5	41.6	51.2	44.7	39.2	27.8	31.1	29.8
Thailand	40.2	48.8	61.9	60.2	52.6	51.0	49.3	45.5
South Korea	51.7	51.5	49.2	36.8	33.7	33.6	33.7	30.3

Source: Author's calculation based on UN Comtrade database.

Figure 6.1: Similarity Indices between Vietnam 2003's Exports Composition with those of South Korea and ASEAN-4, Selected Years (%)



Source: Author's calculation based on UN Comtrade database.

6.4.1.1 Vietnam-Korea

In 2003, Vietnam's economic structure was the most similar to that of South Korea in 1980 with a high index of 51.7 per cent. Since then, this index pattern has gradually been declining over time ending up at 30.3 per cent in 2003. This divergent correlation implies that there has been an increasing gap between Vietnam's and South Korea's merchandise export structures.

The dissimilarity of the two countries' economic structure reflected by their widening export composition denotes that their speed of economic development has been quite different, either South Korea has been moving on very fast or Vietnam has undergone a limp and slack development or both. From the above analysis, it could be concluded that Vietnam's export structure has kept lagging behind that of South Korea for at least twenty-three years (1980-2003). Lack of the fact that disaggregated data for Vietnam before 1980 and after 2003, and the index for 1980 was highest in the time series and seemed to be so in pre-1980 years prevents definite conclusions being drawn for years other than 1980-2003.

It is noticeable from observing Table 6.3 that Vietnam's primary and manufacturing sectors are also twenty-three years and twenty years respectively behind those of South Korea. In other words, with respect to manufacturing industries, Vietnam has been lagging behind South Korea for at least twenty years in the industrialisation process.

6.4.1.2 Vietnam-Indonesia

The association of Vietnam-Indonesia's exports overlap sharply increased over 1980-1994 with their similarity index peaking at 69.7 per cent of exports overlap in 1994. This denotes that Vietnam's export structure progressively moved closer to convergence towards that of Indonesia. This would infer that either Vietnam's export growth was high or that of Indonesia was low.[68] However, this trend reversed in the following three years with a similarity index of 62.1 per cent in 1997 before picking up again at 68.7 per cent in 1999 and remaining stable at around 66.5 per cent from 2001.

As in the case of South Korea, the data shows that Vietnam's export structure has been lagging at least nine years behind that of Indonesia, and the same conclusion can be drawn for the primary sector. In terms of industrialisation speed, Indonesia is moving approximately seven years ahead of Vietnam (SI = 35.6 highest in 1999).

[68] This will be discussed further in Section 6.4.3.

6.4.1.3 Vietnam-Malaysia

In 2003, Vietnam's export structure was the most analogous to that of Malaysia and South Korea in 1980 with nearly 52 per cent of exports overlap. Nevertheless unlike South Korea, Vietnam-Malaysia's similarity in merchandise exports experienced an upward trend in the first ten years (1980-90), and then declined during the following eleven years (to 2001) before slightly picking to as same level as in 1997. Compared with other countries in the group (look vertically in '1985' column at 'Total Merchandises' section), Vietnam-Malaysia's similarity index was highest in 1985 at 56.5 per cent; this position however shifted to Thailand in 1990 (61.9 per cent) before moving to Indonesia from 1994 (69.7 per cent) onwards.

Between the two countries, Malaysia's manufacturing and total merchandise export structure in 1990 was the most comparable to that of Vietnam in 2003. This suggests that Malaysia's industrialised and exports structures were considered at least thirteen years more advanced than those of Vietnam, while Malaysian primary sector was about five years ahead of Vietnam. On the upshot, a further consequence could be that Vietnam will need a further five-year period to improve its primary sector in order to be analogous to that of Malaysia. In most of developing countries, the agricultural development stage is usually to take the initiative first, then follow with an era of industrialisation where a very high portion of physical, capital and human resources is shifted from the agricultural to the manufacturing sector. Observing Table 6.3 again, this process could be confirmed by the fact that high similarity indices in primary sector between Vietnam and all the countries in the group always occurred at about five to seven years prior to those of the manufacturing sector. This is also consistent with the 'five-stages' of export model (Balassa, 1979) mentioned in the introduction of this chapter.

6.4.1.4 Vietnam-Philippines

Likewise, looking through the time series from 1980 to 2003, the similarity index for Vietnam and the Philippines in the primary sector was highest at 22 per cent in 1990, while this index in the manufacturing sector recorded the highest of 31.3 per cent seven years later (1997). The gap in exports overlap, which has lessened between the

two countries from 1990, suggests that the Philippines' exports structures are leading those of Vietnam for at least thirteen years. With respect to industrialisation, the Philippines is more advanced than Vietnam by approximately nine years.

Vietnam-Philippines' similarity indices were lowest compared to the others starting in 1998 and ending with a value of 29.8 per cent in 2003.

6.4.1.5 Vietnam-Thailand

Like Malaysia and the Philippines, the exports overlap between Vietnam and Thailand was highest among the group at 61.9 per cent in 1990 (vertical) and in the time series (horizontal) for Thailand. However, this trend has been declining since then as the pace of economic development has not been synchronous between the two countries. Vietnam's industrialisation and economic development has been lagging at least fifteen years behind that of Thailand.

Within the group, Vietnam's export structure in 2003 was the most analogous to that of Indonesia with a similarity index of 66.4 per cent, more than twice as in the case of the Philippines and South Korea while this similarity index for Malaysia and Thailand was 43.6 and 45.5 per cent respectively.

It is inferable that, in the process of industrialisation, first-tier NIC South Korea is eleven years more advanced than the second-tier NICs of Malaysia and Thailand; who are then seven years ahead of the newcomer in the second-tier NICs, the Philippines. Concurrently, the industrialised development gap between Indonesia and the Philippines is approximately two years.

6.4.2 Using Revealed Comparative Advantage Index

In this section, we use non-parametric tests on South Korea and the ASEAN-5's revealed comparative advantages for the twelve manufacturing product groups[69] from a different source, the World Trade Organisation's database, which provides

[69] (1) Manufactures; (2) iron and steel; (3) chemicals; (4) pharmaceuticals; (5) machinery and transport equipment; (6) office and telecommunications equipment; (7) electronic data processing and office equipment; (8) telecommunication equipment; (9) integrated circuit and electronic components; (10) automotive products; (11) textiles; and (12) clothing.

aggregated data for Vietnam (from 1997) up to 2004, whereas the disaggregated data at the three-digit level of the SITC (Revision 3) from the United Nations Comtrade database are available only (from 1997) to 2003. The figures reported in the following Table 6.4 and Figure 6.2 are the Spearman rank correlation coefficients of Vietnam's revealed comparative advantages of the abovementioned product groups for 2004, and those of South Korea and the ASEAN-4 for the same selected years as discussed in the previous section.

The same interpretation is applied here. In 1980, Vietnam-South Korea's correlation coefficient was highest at 0.67. However this position shifted to Thailand from 1983 to 1993, and then Indonesia has taken over this position, having the highest correlation (with Vietnam) in the group from 1994 afterwards. Looking horizontally through the time series, this correlation was highest at 0.86 for Indonesia in 2001 until 2004 and for Malaysia at 0.44 in 1990, as well as peaking at 0.61 and 0.73 for the Philippines and Thailand respectively in 1994. This suggests that South Korea's industrialised structure has been more advanced than that of Vietnam for at least twenty-four years. Simultaneously, Vietnam's industrialisation has been lagging behind that of Indonesia by approximately five years, behind Malaysia at least fourteen years, and ten years at least behind the Philippines and Thailand. Figure 6.5 illustrates further these interpretations.

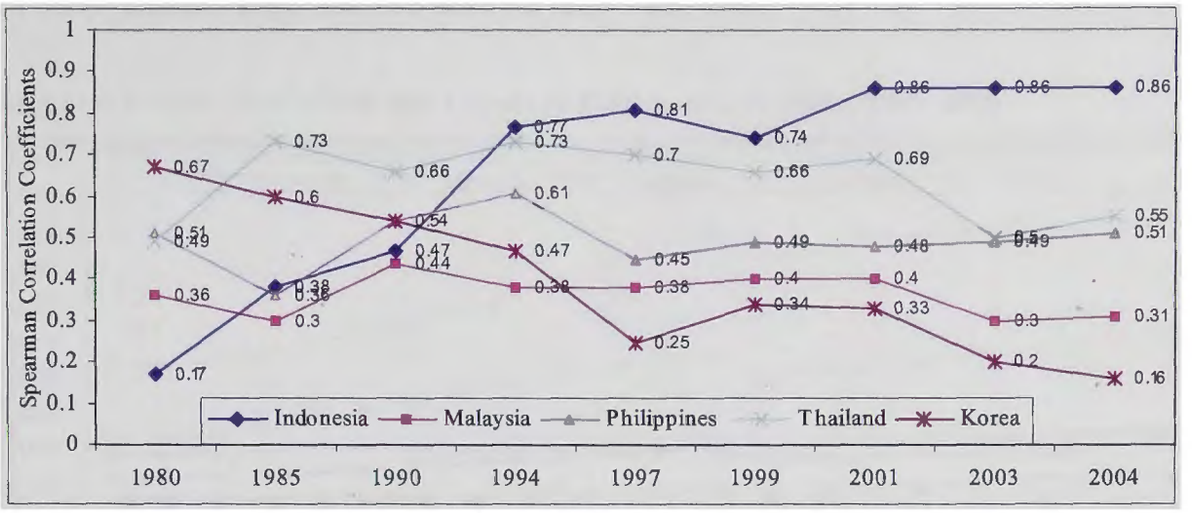
This finding is well in line with that of Srisathaporn (1997) and of Fukushima and Kwan (1995), where they find that the level of development of Thailand is roughly thirteen years at least and sixteen years apart from South Korea respectively.

Table 6.4: Spearman Rank Correlation Coefficients between Vietnam 2004's RCA for the Manufacturing Sector and those of South Korea and the ASEAN-4 for Selected Years

	1980	1985	1990	1994	1997	1999	2001	2003	2004
Indonesia	0.17	0.38	0.47	0.77**	0.81**	0.74**	0.86**	0.86**	0.86**
Malaysia	0.36	0.30	0.44	0.38	0.38	0.40	0.40	0.30	0.31
Philippines	0.51	0.36	0.54	0.61*	0.45	0.49	0.48	0.49	0.51
Thailand	0.49	0.73**	0.66*	0.73**	0.70*	0.66*	0.69*	0.50	0.55
South Korea	0.67*	0.60*	0.54	0.47	0.25	0.34	0.33	0.20	0.16

Notes: * Correlation is significant at the 0.05 level. ** Correlation is significant at the 0.01 level.
No * denotes correlation is significant at the 0.10 level. SPSS outputs are in Table A6.2.
Source: Author's calculation based on WTO database.

Figure 6.2: Spearman Rank Correlation Coefficients of Vietnam's RCA for 2004 and those of South Korea and the ASEAN-4 for Selected Years



Source: Author's calculation based on WTO database.

6.4.3 Using GDP Per Capita

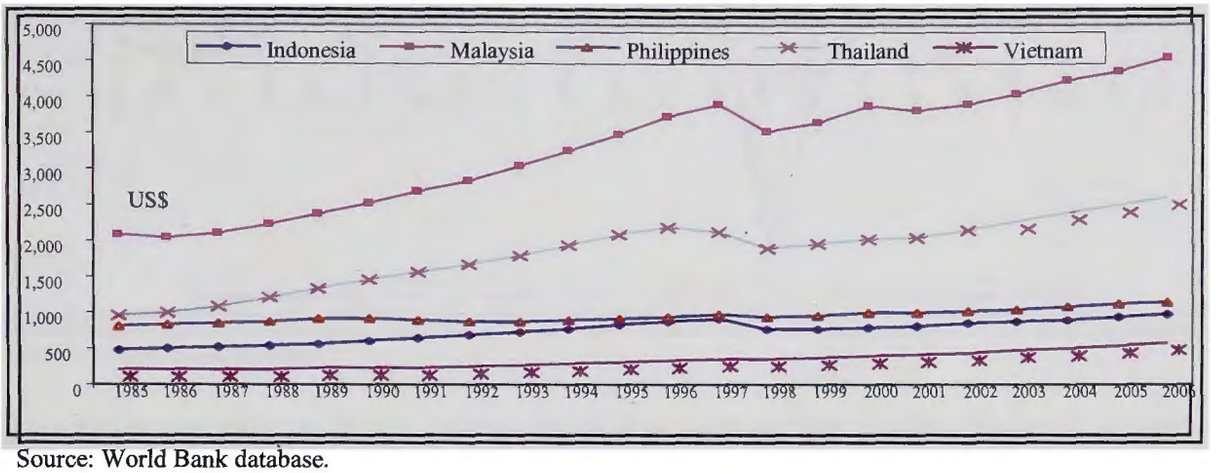
The last method used here to determine the lead-lag relationship between Vietnam and the ASEAN-4 is to compare Vietnam's GDP per capita with that of the ASEAN-4 to see how large or small the development gap is between them. Is it that 'the rich countries get richer and the poor countries get poorer'? Given the recent per capita income growth experiences of Vietnam and the ASEAN-4 over 1985-2006, this section investigates the following questions:

- How long would it take for Vietnam to reach the ASEAN-4's real per capita income as in 2006?
- How many years would it take for Vietnam's per capita income gap to be eliminated against the ASEAN-4? In other words, how long will Vietnam catch up as the same living standard level as the ASEAN-4, with respect to GDP per capita?

Among the ASEAN-5, Malaysia is the 'richest' country with GDP per capita (constant 2000 US$) valued at US$4,535 in 2006. Thailand follows second at US$2,601; the Philippines was less than a half of Thailand at US$1,154. Indonesia was the second last at US$983 and Vietnam earned only US$576 in the same year, a double increase after 12 years with an average GDP per capita growth rate of 6.1 per cent. Figure 6.6 shows the trend of the ASEAN-5's real GDP per capita from 1985 to

2006. It is noted that Vietnam's real GDP per capita only exceeded the US$500 level in 2004, also a double increase after 12 years from 1992.

Figure 6.3: ASEAN-5's GDP per Capita in US$ (constant 2000), 1985-2006



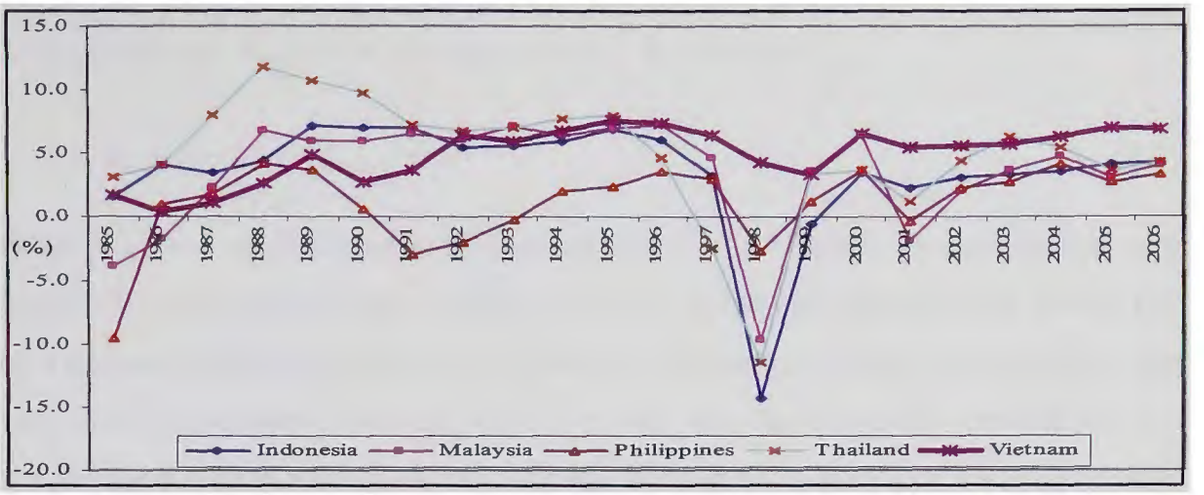
Source: World Bank database.

In contrast to Figure 6.3 above, where Vietnam's GDP per capita trend line is always at the bottom of the chart compared with the ASEAN-4, Figure 6.4 shows its trend line of GDP per capita growth rate has gradually surged up from zero per cent in 1986 to 7.6 per cent highest in 1995, and this was maintained above the ASEAN-4's GDP per capita growth rate for the rest of the period, except in 1999 and 2003, where the GDP per capita growth rate of Malaysia and Thailand was slightly higher than that of Vietnam.

Contrary to Vietnam, Thailand's GDP per capita growth rate was relatively high from the beginning of the period, especially during the decade of its remarkable export boom from the mid 1985s to the mid 1995s when Thailand's average GDP per capita growth rate was 7.7 per cent annually. At some point in time, particularly in the three consecutive years 1988, 1989 and 1990, the annual growth rate of Thailand's GDP per capita peaked at an outstanding rate of 12 per cent, 11 per cent and 10 per cent respectively.

It is noticeable that, over 1985-2006, the average annual growth rates of Thailand's and Vietnam's GDP per capita were highest at 5 per cent, while those of the Philippines and Indonesia were only 1.1 per cent and 3.5 per cent respectively.

Figure 6.4: ASEAN-5's Real GDP per Capita Growth Rate (%), 1985-2006



Source: World Bank database.

To answer the two questions brought up in this section; this familiar formula is used here:

$$S = P\,(1 + r)^{n} \qquad [6.2]$$

Where P is the principal sum and S is the sum to which the principal grows at an annual rate of growth r over n years.

Now, let Y_A = ASEAN-4's per capita income in 2006;

Y_V = Vietnam's per capita income in 2006;

r_A = ASEAN-4's future per capita income growth rate as in 2000-06 period;

r_V = Vietnam's future per capita income growth rate as in 2000-06 period.

The equation [6.2] becomes:

$$Y_A = Y_V\,(1 + r_V)^{n} \qquad [6.3]$$

from which:

$$n = \frac{\log \frac{Y_A}{Y_V}}{\log\,(1 + r_V)} \qquad [6.4]$$

n is the number of years that Vietnam needs to reach the living standard enjoyed by the ASEAN-4 in 2006. Nevertheless, the world we are living in is not static, but dynamic and moving. While the Vietnamese economy is progressing, others also keep moving ahead. Catching-up therefore requires a number of years much greater than n, and this depends entirely on Vietnam's per capita income growth rate and that of

other countries. On the other hand, if the per capita income gap is eliminated between Vietnam and the ASEAN-4, the equation [6.3] becomes:

$$Y_A (1 + r_A) = Y_V (1 + r_V)^n \qquad [6.5]$$

From [6.5], we can find how long it would take *(n)* for Vietnam to catch up the same level of living standard as the ASEAN-4, as long as the per capita income growth rate of Vietnam is higher than that of the ASEAN-4; otherwise the per capita income gap will never be eliminated between them. Certainly, another exogenous variable that has a vital impact on the ultimate result is the population growth rate of each country involved, which is negatively correlated with per capita income. In other words, other factors must be constant in order to generate reliable outcomes.

In explaining the catch-up process, Hong (1990) notes that many economists have argued that an underdeveloped economy has a stronger growth potential than an advanced one because it can install the most up-to-date capital equipments and adopt the latest production and organisational technologies. A latecomer has the opportunity to gain technological advantages, which potentially reduce the existing productivity gap more quickly. Concurrently, they accentuate the feature between the potential for catch-up and the factors enabling the realisation of potential. It is often believed that the existence of a proper political leadership and a strong government constitute the absolutely necessary environment for an underdeveloped economy to begin the process of catching-up in order to become an advanced economy.

Equation [6.5] becomes:

$$n = \frac{\log \frac{Y_A}{Y_V}}{\log (1 + r_V) - \log (1 + r_A)} \qquad [6.6]$$

The ASEAN-5's real GDP growth rates used in these calculations are based on the average per capita income growth rates over 2000-06 and assumed constant in the long-term future. Table 6.5 summarises the ASEAN-5's real per capita income in 2006 at 2000 prices and their average growth rates for 2000-06.

Table 6.5: ASEAN-5's Real GDP per Capita in 2006 and GDP per Capita Average Growth Rate, 2000-06 (%)

	Real GDP per capita in 2006 (US$ constant 2000)	Real GDP per capita average growth rate for 2000-06 (%)
Indonesia	983	3.5
Malaysia	4,535	2.6
Philippines	1,154	2.5
Thailand	2,601	4.3
Vietnam	576	6.2

Source: World Bank database.

Results are reported in the following Table 6.6. In terms of real GDP per capita, Vietnam has been lagging nine years behind Indonesia, twelve years behind the Philippines, and it would take Vietnam twenty-five and thirty-four years to reach the same level of per capita income as in 2006 for Thailand and Malaysia respectively. In other words, Vietnam's real GDP per capita will attain the level of US$983 in 2015; US$1,154 in 2018; US$2,601 in 2031 and US$4,535 in 2040.

Table 6.6: Number of Years Vietnam Needs to Reach the ASEAN-4's GDP per Capita same as in 2006 and to Catch Up the Same GDP per Capita Level

	Years Vietnam needs to reach real GDP per capita as in 2006 of the following:	Years Vietnam needs to catch up the same real GDP per capita level as the following:
Indonesia	9	21
Malaysia	34	60
Philippines	12	20
Thailand	25	84

Source: Author's calculation based on World Bank database.

With similar calculations as in 2006, the above analysis also suggests that, among the ASEAN-4, while Malaysia has been a pioneer in the process of economic development towards developed countries, thirteen years well ahead of Thailand and fifty-five years ahead of the Philippines; Indonesia concurrently was a latecomer, lagging five years behind the Philippines. However, if the abovementioned presumptions regarding the per capita income and population growth rates remain constant in the long-term future; then Thailand will definitely overtake Malaysia, taking on the leading position in the group from 2040. This is because Thailand's per capita income growth rate is 1.7 percentage points higher than that of Malaysia.

To catch up the same standards of living as of the ASEAN-4 countries, Table 6.6 shows that Vietnam needs 21 years, 60 years, 20 years and 84 years respectively.

Also, based on the analysis in sub-sections 6.4.1 and 6.4.2 using the SI and RCAI, the target that Vietnam will turn to a newly industrialising country by 2020 is feasible. This reality would transpire approximately in 2018 with the condition that Vietnam's major development indicator indices (GDP, GDP per capita) remaining constant towards 2020. However, the higher these indices, the shorter the time Vietnam will achieve that target and vice versa.

It should be emphasised here that this appraisal is based on the fact that Thailand and the Philippines has recently been recognised as newly industrialising countries in 2007.

6.5 Implications of Continuing the 2000-06 Growth Pattern

To further support the arguments in Section 6.4 above regarding Vietnam's transition from a developing to a newly industrialising country by 2020, this section provides an overall outlook of Vietnam's economy in the year 2020 by asking what its economic structure would be for that year, if Vietnam could sustain a high GDP growth rate towards that milestone as in recent years. The projection of Vietnam's economic structure in 2020 is based on the average growth rate for the 2000-06 period of total value added, total employment and output per worker of the whole economy as well as of sectoral economy. In other words, all these growth rates are kept constant for 2007-20.

While the second last column of Table 6.7 shows the output (in US$ billion), output per worker (in US$) and the number of workers (in million) for 2006 and 2020 and their change, the last column shows their sectoral share of total output (value added) and total employment.

6.5.1 Total Economy

If the average growth rate of Vietnam's GDP were constant at 7.5 per cent over the 2007-20 period, then Vietnam would produce a total output value of US$147.5 billion in 2020 at 2000 prices, an increase of 205 per cent or threefold from total output of US$48.4 billion in 2006. With an average growth rate of total employment at 2.4 per

cent, the number of total workers in all sectors will increase by 56 per cent, from 43.3 million workers in 2006 to 67.6 million workers in 2020, indicating 68 per cent of a total population of 99.4 million people in 2020. This is a very high rate of labour input compared with other countries. Would this factor be attainable and lead to an extensive growth for Vietnam's economy? Yet, the issue of whether Vietnam's economic growth is extensive or intensive will be discussed in the concluding Chapter Eight.

Table 6.7: Projection of Vietnam's Economic Structure in 2020 Compared to 2006 (US$ constant 2000)

Sector	(*)	Average growth rate 2007-20 (%)	Output, output per worker (US$) and employed persons in			Share (%)		
			2006	2020	Change (%)	2006	2020	Change (%)
Agriculture	Output	3.8	9.5	16	68	19.7	10.8	-8.9
	Labour input	-0.3	24.0	22.9	-5.0	55.6	33.9	-21.7
	Output per worker	4.1	398	700	76			
Manufacturing	Output	11.8	11.3	53.5	373	23.3	36.3	13.0
	Labour input	8.1	5.6	16.7	198	12.3	24.8	12.5
	Output per worker	3.4	1,995	3,196	60			
Non-manufacturing Industry	Output	8.6	9.3	29.6	218	19.2	20.1	0.9
	Labour input	6.0	2.7	6.1	126	6.6	9.0	2.4
	Output per worker	2.6	3,472	4,889	41			
Services	Output	7.2	18.3	48.4	164	37.8	32.8	-5.0
	Labour input	5.0	11.0	21.8	98	25.5	32.4	6.9
	Output per worker	2.0	1,663	2,209	33			
Whole economy	Total output	7.5	48.4	147.5	205			
	Total labour input	2.4	43.3	67.6	56			
	Output per worker	5.1	1,118	2,183	95			
	Population	1.2	84	99.4	20			

Notes: (*) Output in US$ billion; output per worker in US$; and labour input in million of workers.
Output per worker for 2006 in this table is slightly different with that of other tables in Chapter Eight because of discrepancy in sectoral employment data obtained from Vietnam GSO and the WB database.
Source: Vietnam GSO data.

Meanwhile, general output per worker will increase by 95 per cent, from US$1,118 in 2006 to US$2,183 in 2020, an increase of less than twofold in 14 years. Compared with both the first-tier and second-tier NICs during the peak time of their industrialised development, this is a very slow growth. This growth usually has a

double increase (or more) of output per worker in every ten years for China as well as the first-tier and second-tier NICs.[70]

6.5.2 Agriculture

In 2020, if all the growth rates remain constant as in column 3, Vietnam's agriculture output will produce US$16 billion (at 2000 constant prices), which means an increase of 68 per cent from 2006 and a decline in its share of total GDP by –8.9 percentage points, from 19.7 to 10.8 per cent. While Vietnam's agricultural labour force will decrease by –5 per cent, from 24 million to 22.9 million workers between 2006 and 2020; its share of total employment will significantly drop by –21.7 percentage points, from 55.6 to 33.9 per cent.

Agricultural output per worker will increase by 76 per cent, from US$398 in 2006 to US$700 in 2020; an increase of less than twofold in fourteen years as well. It is noted that Vietnam's agricultural output per worker in 2020 would be the same as that of China and Indonesia in 2006, and about one-tenth of Malaysia (US$6,440), three-fifths of the Philippines (US$1,127) and four-fifths of Thailand (US$839) in 2006.[71]

6.5.3 Manufacturing

Manufacturing industries probably are the most important sector to boost Vietnam's economy to sustain a high growth, because its growth rate has been highest among all sectors with an average annual growth of around 12 per cent. With this growth rate, manufacturing output will increase significantly by 373 per cent (nearly fivefold), from US$11.3 billion in 2006 to US$53.5 billion in 2020, indicating an increase of 13 percentage points for manufacturing share of GDP, from 23.3 to 36.3 per cent. Concurrently, while the number of workers in manufacturing sector will enlarge by 198 per cent (nearly threefold), from 5.6 to 16.7 million workers; the share of manufacturing labour inputs will increase by 12.5 percentage points, from 12.3 to 24.8 per cent.

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[70] For the eleven-year period between 1995 and 2006, Vietnam's output per worker increased by 1.7-fold while that of China increased by 2.4-fold and around 1.2-fold for the ASEAN-4. This will be discussed in more details in Chapter Eight.

[71] This will be discussed further in Chapter Eight.

Output per worker will increase by 60 per cent from US$1,995 in 2006 to US$3,196 in 2020, an increase of only 1.6-fold in fourteen years. It is worth to note that Vietnam's manufacturing output per worker in 2020 would be less than that of China in 2003 and of the ASEAN-4 in 2006.[72]

6.5.4 Non-manufacturing Industry

The growth rate of non-manufacturing industries has been second to manufacturing with an average annual growth rate of 8.6 per cent. This sector output will increase by 218 per cent, from US$9.3 billion in 2006 to US$29.6 billion in 2020; whereas the share of this sector will slightly increase by 0.9 percentage point from 19.2 to 20.1 per cent over the same period. The share of labour inputs in total employment will also increase by 2.4 percentage points, from 6.6 per cent in 2006 to 9 per cent in 2020 because the number of workers in this sector will expand from 2.7 to 6.1 million workers, an increase of 126 per cent or more than twofold over the same period.

Non-manufacturing output per worker will increase by 41 per cent, from US$3,472 in 2006 to US$4,889 in 2020. This level of output for Vietnam in 2020 will be 1.3-fold more than that of the Philippines but less than the others in 2006.[73]

6.5.5 Services

Following the declining share of agriculture in total GDP, the share of services output in GDP will decline by 5 percentage points, from 37.8 per cent in 2006 to 32.8 per cent in 2020, although its output will increase by 164 per cent (2.6-fold) from US$18.3 billion to US$48.4 billion over the same period. The share of services sector in total employment will increase by nearly 7 percentage points from 25.5 to 32.4 per cent while its labour inputs will increase by 98 per cent from 11 million workers in 2006 to 21.8 million workers in 2020. Change in output per worker will be smallest

[72] China's manufacturing output per worker in 2003 was US$5,904 and that of the ASEAN-4 respectively in 2006 was US$5,273; US$19,498; US$7,135 and US$10,947. Chapter Eight will discuss in detail.

[73] In 2006, non-manufacturing output per worker for the ASEAN-4 respectively was US$5,264; US$14,052; US$3,694 and US$7,916.

among all sectors with 33 per cent between 2006 and 2020 as this sector's growth rate of 2 per cent is lowest.

In 2020, Vietnam's services output per worker would be US$2,209, less than that of China and of the ASEAN-4 in 2006, only around 65 per cent of China and the Philippines, 90 per cent of Indonesia, 27 per cent of Malaysia and 38 per cent of Thailand.[74]

Generally speaking, manufacturing and non-manufacturing industries will be the two key sectors enhancing Vietnam's future economic growth with a combined contribution of 56.4 per cent of total GDP in 2020, followed by the services sector with 32.8 per cent whereas the contribution of agriculture will only be 11 per cent roughly.

It is noticeable that the share of labour inputs of each sector (agriculture, industry and services) in total employment would be well-proportioned at around 33 per cent in 2020. More specifically, a reduction of 21.7 per cent of labour inputs from agricultural sector will be shifted to other sectors as follows: manufacturing (12.5 per cent), non-manufacturing (2.4 per cent) and services (6.9 per cent).

[74] In 2006, China's output per worker in services sector was US$3,413, while that of the ASEAN-4 respectively was US$2,396; US$8,078; US$3,286 and US$5,829.

6.6 Summary and Concluding Remarks

As noted earlier, there is a common view that one feature of development, especially in the East Asian model, is a progressive structural change in exports from resource and labour intensive products to those which are more intensive in terms of capital, skill and technology. In this chapter, two applications of this principle are used to study the structure of Vietnam's exports in relation to the ASEAN-4, and then the implications of continuing the current pattern of Vietnamese development through to 2020 are assessed.

The first application uses the Finger and Kreinin (1979) similarity index, which measures the similarity in the export structures of two countries relative to a third country (here taken to be the world). Similarity indices are calculated for Vietnam relative to each of the ASEAN-4 at the 247 commodity SITC (rev. 3) level for 1997-2003, and these show that Vietnam's export structure has much in common with that of Indonesia but has little similarity to that of Malaysia, Thailand or the Philippines. A similarity analysis is also conducted at the twenty-three group level to compare Vietnam's export structure in 2003 with that of the ASEAN-4 countries and South Korea from 1980 to 2003. This analysis shows that Vietnam's 2003 structure was most similar with that of South Korea in 1980, with those of Malaysia, Thailand or the Philippines in 1990 and with that of Indonesia in 1994. On the basis of the structural change in exports principle, this can be taken as a measure of how far Vietnam is behind these countries.

The second application uses an adaptation of the technique of Lutz (1987) to study the changes in revealed comparative advantage (RCA) across industries over 1997-2003. One key finding is that in particular labour intensive industries in which Vietnam has high and rising revealed comparative advantage (such as clothing, textiles and personal and household goods), there is a negative correlation between changes in RCA in Vietnam and in each of the ASEAN-4 countries, illustrating the shifts of these industries from the ASEAN-4 to Vietnam. Finally, the degree of correlation between RCA indices for Vietnam in 2004 and the countries of ASEAN-4 plus South Korea over a range of years back to 1980, for twelve industries, is calculated. The results

show a strong correlation only for Indonesia, and very little correlation for South Korea in 2004. The highest level of correlation with Vietnam's RCA pattern in 2004 is with that of South Korea in 1980, of Malaysia in 1990 and of the Philippines and Thailand in 1994.

To a large extent, it is obvious that the structure of export commodities among the ASEAN-4, particularly for the second-tier NICs of Malaysia, the Philippines and Thailand has shifted away from low value-added traditional labour-intensive industries to high-technology industries. Generally, shifting in comparative advantage of low-tech industries has occurred from all the ASEAN-4's economies to Vietnam; of some medium-high-tech industries from Malaysia; of some high-tech industries from Indonesia; and of some medium-low-tech industries from the Philippines. Footwear is a unique industry that Vietnam has received a shift in comparative advantage from all countries of the ASEAN-4.

The extent of competitiveness between Vietnam's exports and those of the ASEAN-4 can be said moderate or somewhat more complementarity than competitiveness; as Vietnam is a latecomer in the process of development and integration in the world economy. In other words, Vietnam and the ASEAN-4 are in different stages of economic development. This is why Vietnam is beneficial in receipt of manufacturing industries shifting from the ASEAN-4 because of low labour costs. Nevertheless, whether competitive or complementary, it is essential for Vietnam to improve the quality of its exports and enhance its labour productivity in order to compete globally and sustain high economic growth in the long run, particularly with its recent accession into the WTO. Porter (1990: 9) states that the expansion of exports because of low wages and a weak currency may create a trade balance or surplus but lowers the nation's standard of living. Instead, the ability to export many goods produced with high productivity is a more desirable target because it translates into higher national productivity.

Unfortunately, the projection of Vietnam's economic structure for 2020, based on constant growth rates for 2000-06 as in Table 6.7, shows that the level of Vietnam's total and sectoral productivity is very low, almost less than that of China and of the

ASEAN-4 in 2006, especially compared with Indonesia and the Philippines, the two poorest of the ASEAN-4.

One of the repeated objectives of the Vietnamese Government is to become a newly industrialising country by 2020. While there are no agreed criteria for achieving this status, it is widely recognised as linked to the transfer of resources from agriculture to manufacturing and to the achievement of a minimum standard of GDP per capita. In the light of the fact that both Thailand and the Philippines have recently been recognised as newly industrialising countries, the characteristics of the poorer of these (the Philippines) might be taken as providing minimum conditions. In 2006, the Philippines had GDP per capita of US$1,154 in 2000 prices, with 15 per cent of value-added (and 37 per cent of employment) in agriculture and 29.6 per cent of value-added (and 14.5 per cent of employment) in industry.

The projection of 68 per cent of population employed in the labour force in 2020 is clearly unattainable, and the low level of productivity will certainly have a negative impact on the national living standard. Vietnam, thus, needs to boost the growth rate of productivity by 2 percentage points annually, from 5.1 to 7.1 per cent, in order to achieve a double increase in productivity level every ten years, instead of fourteen years. If doing this, the target of turning to a newly industrialising country by 2020 surely will be achievable, and Vietnam's output per worker for this year would reach the US$3,000 level (at constant 2000 prices), higher than that of China, Indonesia and the Philippines as in 2006.

Even with the annual growth rate of total output at 7.5 per cent and total productivity at 5.1 per cent as in the recent 2000-06 period, and the criterion of economic composition of less than 20 per cent for agricultural output and more than 50 per cent for industrial output as defined in this chapter, then Vietnam – compared with the Philippines – would reach the low level of NIC status by 2020 with per capita GDP of US$1,337 in 2000 prices, and with the share of value-added down to 10.8 per cent in agriculture and up to 56.4 per cent in industry. Nonetheless, would this really classify as modernising industrial growth while the national living standard is still low, and the projected output per worker in Vietnam in 2020 is still 24 per cent below that of the Philippines in 2006?

Does Vietnam have a good potential to sustain the current growth rate, or even to achieve a higher output growth rate in the long run?

Part III of this study will clear up this question with Vietnam's export potential in Chapter Seven, and the quality of Vietnam's economic growth in Chapter Eight.